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The Bancroft Oration.[1]

FUNCTIONAL DISORDER SEQUENT TO ORGANIC DISEASE.

By A. W. HOLMES À COURT,
Sydney.

THE invitation to deliver the Bancroft Oration is an honour of which the recipient must be profoundly appreciative, rightly regarded as a pinnacle of achievement for a practising physician in Australia.

For a Queenslander by birth it is particularly gratifying to return to Brisbane as your honoured guest. It may be said without presumption that the institution of such a memorial lecture is of itself a desirable object, ensuring as it does that the work of a distinguished man should be commemorated at the scene of his labours and his memory perpetuated.

For us individually it is of interest to attempt to recapture the professional outlook of Bancroft's day and to study his mental approach to the problems which he elucidated.

The history of the life-work of Joseph Bancroft has been so carefully and thoroughly related by previous occupants of this rostrum that it would appear unnecessary to review the details of his scientific and professional attainments, which are already well known to members of the profession in Australia; suffice it to remark that he was a man of wide interests apart from the practice of medicine, concerning himself with botanical and biological investigations, exhibiting a scientific yet essentially practical approach to any problem which he undertook.

Although Bancroft's discovery of the adult female of *Filaria* has given his name a permanent place in medical annals, his botanical researches are probably of at least an equal importance.

His recognition of *Duboisia* as a source of hyoscyamine has proved of great practical value and made possible the local production of much-needed narcotics in commercial quantities during the acute drug shortage of the recent world war. *Inter alia* it is interesting to read that he took part in packing the first consignment of trout ova which was sent to Tasmania and New Zealand, an action for which those who are trout fishermen should be eternally grateful. Thus, on occasion, does the good men do live after them!

From the purely philosophical standpoint the life of an individual must assuredly be adjudged by posterity as having been justified if he had contributed to the pool of scientific knowledge or added to the sum of human happiness. It is certain that the life of Bancroft was abundantly worth while as assessed by such standards.

Apart from the records of scientific work, the brief glimpse of his professional outlook and character which has been left to us in the writings of Dr. Sandford Jackson reveals him as a keen observer and clinician and an enthusiast for the investigation of the problems of disease, to be regarded as an early exponent of clinical science in contradistinction to academic laboratory research.

It is to emphasize this aspect of his work that a purely clinical subject has been selected for presentation to you—"The Disorders of Function Sequent, or in Relation to, Organic Disease".

It will at once be apparent that the study of this aspect of clinical medicine involves precise observation, exact diagnosis and analysis of the mechanism of the production of symptoms in disease as well as an appreciation of the psychological reaction of the patient to his malady. It has in fact been aptly remarked that "the study of man in disease may be of an importance equal to the study of disease in man".

It is surely within the experience of every physician that not infrequently functional disability persists in an

[1] Delivered at Brisbane on June 7, 1946.

individual long after the pathological processes which produced the initial disturbance have ceased to be operative or have at least become stabilized at a fixed level, insufficient to account for the residual symptoms. Functional disability is indeed liable to become engrafted upon organic disease to such an extent that there are few symptoms which may not be produced or simulated by functional disorder, and almost all are prone to be aggravated or perpetuated by suggestion. This may be autosuggestion arising from the initial painful sensation or loss of power experienced by the patient in injury or illness, or may be heterosuggestion unconsciously provided by his medical attendants or others.

The doctor may in fact be unwittingly "pathogenic" by the unintentional suggestion of symptoms which are liable to become perpetuated in the mind of the patient. Although this general principle is universally accepted, the extent of its implications in civil life usually receives inadequate recognition in ordinary practice, in contradistinction to the prominence given to the development of war and compensation neuroses, in which a profit motive also may play a conscious or subconscious part. In either case the mental mechanism involved may be, and is usually, entirely distinct from that of malingering, being dependent on the patient's exaggerated belief in the degree of disablement, rather than on a desire to deceive.

The thesis can most readily be expounded by reference to recorded cases among patients who exhibited functional phenomena following organic disease to an unusual degree.

To descend from the general to the particular attention is directed to certain significant cases.

Case I was one of postural deformity of the lower limbs engrafted on a preexisting basis of organic disease.

A female patient, aged thirty-four years, was admitted to hospital complaining of loss of power in the lower limbs and pain in the right hip and left knee. She had been in bed for ten and a half years. Her history was devoid of interest until she was aged twenty-two years. Thence after four attacks of pleurisy (two of which were accompanied by effusion) she developed persistent cough and sputum. Pain in the right renal region appeared, associated with pyuria, and she was admitted to a hospital with the diagnosis of renal tuberculosis, and nephrectomy was proposed. Further investigation revealed the presence of active pulmonary disease rendering her unfit for operation and resulting in transfer to a sanatorium. After a period of four and a half years she had improved in general condition and was taken home, where she remained in bed continuously for a further period of six years. During this time the tuberculous process in the lung had undergone spontaneous cure by fibrosis and the renal lesion had become inactive. Foot drop developed on both sides, together with pain and stiffness of the right hip and partial fibrous ankylosis of the left knee.

On examination (twelve years after the onset of illness) it was found that movement at the right hip was restricted and that the left knee was semiflexed with some fibrous ankylosis. Both feet were in a "foot-drop" position due to postural deformity; the left foot was in a position of *pes cavus*.

Skiagrams showed "some osteoarthritis of the right hip; rarefaction of bones about the left knee probably resulting from disuse".

Under anæsthesia the fibrous adhesions of the left knee were readily broken down and the right hip was mobilized; the knee was controlled by splinting and the foot-drop deformity was corrected by plaster.

Treatment by psychotherapy in its simplest form of logical explanation was instituted and the patient was made to understand the sequence of events which had produced her disability, and was encouraged to concentrate on muscular movement. After four months she walked well, except for slight stiffness of the right hip, being restored to active life after a bed-ridden existence of nearly eleven years. Her immediate cooperation and acceptance of logical explanation of her disability were remarkable and served to focus attention on the interrelation of psychosomatic factors in disease.

This case was previously recorded in THE MEDICAL JOURNAL OF AUSTRALIA several years ago. It is resurrected here because the perspective of time has served to emphasize its value as an example of the principle under discussion. The patient has remained well and has led an active and useful life for several years.

Case II was one of postural deformity following acute infection.

A female patient, aged twenty-five years, suffered from an acute febrile disease at the age of fifteen years, which was described as "influenza with peripheral neuritis", but was probably of the nature of acute secondary rheumatoid arthritis. Weakness of the back and lower limbs followed. Shortly afterwards the fingers began to lose power and became flexed, and the lower limbs became drawn up with flexion deformity of both hips and knees; both ankles became plantar flexed. At the time of her admission to hospital the patient had been in bed for ten years. The position of the hands revealed peculiar deformity. The fingers of the right hand were contracted in flexion with marked muscular wasting. The thumb and index finger could be moved normally "as though preserved for essential services". The left hand showed all the fingers contracted in flexion—the left thumb was entirely normal. The knees were held in flexion at 90°. Bilateral foot drop was present.

After appropriate orthopædic correction of contractions and psychological explanation the patient was restored to normal activities with minimal residual deformity of the fingers.

Case III was one of functional disability following tuberculous disease of joints.

In 1939 a female patient, aged thirty-eight years, developed swelling and weakness of the left ankle which was found to be tuberculous and associated with inactivated pulmonary disease. She was treated by absolute rest in bed until 1941, when the disease became entirely quiescent; for the next two years she was able to walk and lead an active life. In 1943 she developed a tuberculous infection of the right knee (diffuse white swelling). She was treated by complete bed rest until her admission to hospital on October 2, 1945.

Examination revealed slight swelling of the right knee and left ankle, but no evidence of active disease; some degree of stiffness of both affected joints, but no signs of active disease either in joints or lung; marked wasting of the soft tissues of the left foot. The patient had no inclination to use her limbs, but was eventually persuaded to walk with a caliper fitted to the right leg and the left heel elevated.

Skiagrams revealed "healed tuberculous disease of the lungs; rarefaction of bones about affected joints".

Case IV was one of subacute secondary rheumatoid arthritis.

A female patient, aged twenty-one years, when admitted to hospital had been bedridden for four and a half years following an acute inflammation of joints which apparently originated as a tonsillar infection. The active inflammation had subsided. The left shoulder was adducted with the elbow held in flexion at 90° and the forearm in semipronation with the thumb adducted. The left lower limb was flexed and adducted at the hip; the left knee was flexed with the foot inverted and plantar-flexed at the ankle. The right lower limb was held in flexion at the hip and the knee.

The joints were mobilized under anæsthesia and deformities were corrected by plaster and splinting. The patient was able to walk four months after her admission to hospital.

The subsequent history of this patient is revealing. She has relapsed repeatedly into a condition of bedridden invalidism and has developed postural deformities which have been corrected on subsequent admissions to hospital, only to revert again to the previous state as the spoiled child of misguided parents. She is evidently made of the canvas upon which psychoneurosis is inevitably painted.

The patients described may appear to have presented neglected orthopædic problems essentially, in so far as deformities of the limbs were the obvious signs. The relevant facts, however, are that the disturbance of function which persisted was altogether disproportionate to structural defect and that psychological inhibition had been a dominant factor in causing prolonged immobilization over several years after the severity of the primary disease had abated, allowing postural deformities to develop.

This state of affairs is very prone to arise in patients long confined to bed following joint disease, disuse atrophy stiffness and in some instances postural deformity with fibrous tissue changes, perpetuating the mental inhibition and functional disability which can be appreciated and adequately dealt with only by clear recognition of the

ætiological factors involved and institution of the appropriate treatment. Such cases are not uncommon; not a few must have come within the experience of most medical men of large practice.

Our failure to recognize the functional element in such instances provides the basis for the apparent and sometimes actual success of the osteopath, chiropractor, manipulator and other varieties of unorthodox healer, who, in addition to attacking the residual organic stiffness of joints following acute and chronic disease, are not infrequently adept psychologists capable of assessing and grappling with the mental inhibitions of these patients, creating an optimistic atmosphere of cure, the element of mystery being enhanced by unorthodoxy of method.

In other circles religious ecstasy is a therapeutic agent effective in removing mental inhibitions and providing the necessary psychic stimulus to expedite recovery. As a profession we must accept our share of responsibility for the fact that these exotic cults persist and flourish, nurtured by the credulity of the less critical elements of the population. It is an amazing but inescapable observation that men of great intellectual capacity, highly accomplished and eminently successful in their own particular spheres of activity, may exhibit a credulity almost childish in matters relating to disease.

Ultimate clinical diagnosis in the type of cases described may be relatively easy if sufficient care is taken, particularly in those in which the lesion is of the locomotor apparatus and thus readily available for objective study. Greater difficulty is apt to be encountered in relation to visceral disease where symptoms are chiefly subjective and objective signs minimal.

Cardiac Neurosis.

To leave these specific instances and to revert to the original premise, it will be seen that a similar train of circumstances may be involved in the production of cardiac and other visceral neuroses, some of the underlying mechanisms being essentially comparable. This may be illustrated in the development of cardiac neurosis.

The following history (Case V) is revealing as an example:

A male patient, aged fifty-five years, employed in the army on duties at the base, complained of severe pain on the left side of the thorax after lifting some office furniture in December, 1941. Careful investigation in hospital over a period of six weeks, including radiographic and electrocardiographic examinations, failed to reveal visceral disease, but implanted in the patient the idea of coronary occlusion.

He was examined again in September, 1944. At this time he complained of breathlessness on effort and had "cardiac consciousness". His pulse rate was 84 in the minute. His systolic blood pressure was 124 and his diastolic pressure was 84 millimetres of mercury. Exercise tolerance tests gave satisfactory results. Clinical examination provided no evidence of cardiac disorder. The results of fluoroscopic and electrocardiographic examinations were normal for the patient's age. The original injury probably affected the muscles of the thoracic parieties. A diagnosis of cardiac neurosis was made.

In such cases as this the idea of damage sustained is exaggerated and the psychological reaction is increased by resentment at failure to be regarded as the victim of a permanent war disability; purposive simulation of disease may also be a factor. The symptoms may be nevertheless real to the patient, although actually produced by suggestion following his injury and often "built up" by the solicitude of sympathizing relatives. In civil practice cardiac neuroses, which form a considerable percentage of the problems of the practising physician, may be readily engendered by purely psychoneurotic factors. The diagnoses "D.A.H.", "neurocirculatory asthenia" and similar unfortunate terms commonly employed after World War I, implying as they did a disease of a part of the body which might be in fact only participating in a personality reaction or maladjustment to adverse circumstances, had frequently the effect of determining cardiac neuroticism, although some mild infective process may have played a part in the original tachycardia.

In persons of unstable mental make-up it is important to remember that every psychic tendency seeks adequate bodily expression; just as somatic disease may have its psychological counterpart. In the affairs of civilian practice the unguarded suggestion by the physician of the presence of some cardiac anomaly may produce a profound mental impression and functional disability, the elimination of which offers great difficulty. It is only necessary to recall the unfortunate impression of cardiac collapse under anæsthesia, which may prompt a patient to insist that his doctor advised restriction of activities and warned him never to have an anæsthetic again, whereas no organic cardiac defect may actually exist.

Similarly the subjects of rheumatic carditis may be victims of unduly prolonged and unnecessary restriction, unless it is clearly recognized that structural cardiac defect may be clinically significant only in so far as it interferes with the functional efficiency of the circulatory mechanism. In a long experience as medical consultant to a large maternity hospital it has frequently been observed that the presence of valvular disease of the heart has unjustifiably been regarded as an indication for the prevention or termination of pregnancy, whereas the essential problem is that of estimating the efficiency of cardiac function.

Probably almost every doctor has seen patients who have had their activities unnecessarily curtailed because of the presence of some abnormality of heart sounds, possibly associated with minor structural peculiarity which did not necessarily interfere with the functional efficiency of the heart, the idea of cardiac disease being responsible for profound psychic trauma; similarly the unfortunate suggestion of hypertension is frequently productive of prolonged and unnecessary restrictions. In such cases the pathological changes may have been trivial, the psychological reaction in the patient's mind immense. There are indeed many ways in which the doctor is liable to become unintentionally "pathogenic".

Abdominal Neuroses.

A condition of visceral neurosis characterized by persistent subjective abdominal symptoms is prone to develop in the suggestible type of individual following surgical procedures for organic disease, more particularly when mental stress or domestic unhappiness finds its expression in psychosomatic transfer or similar mechanism. The large group of abdominal neurotics who readily come to the recollection of any practitioner (although it might be happier to dismiss them from memory) are not infrequently the subjects of functional disability superimposed on preexisting disease, in whom symptoms have become perpetuated by suggestion. These persons are often neurotic females with multiple abdominal scars who go from one medical man to another and rarely come to anchor until a mental fixation produced by the unfortunate suggestion of "adhesions" finally confirms the condition of chronic abdominal neuroticism. Such patients have been described as "surgophilic psychoneurotic personalities who crave the drama of surgical performance and co-operate in achieving the harmful results of ill-advised operative procedures".

The remark of that arch-humourist Axel Munthe ("Story of San Michele") in relation to abdominal neurotics at the time when "colitis" was the fashionable disease, is apposite: "Many were not ill at all and might never have become so, had they not consulted me."

In general post-operative abdominal neurosis appears to develop in inverse proportion to the severity of the original pathological condition in the abdomen. The so-called "chronic appendicitis" of the asthenic visceroptotic female has been a common starting point for the development of chronic abdominal symptoms, adding to that unfortunate collection of chronic abdominal invalids encountered in out-patient clinics, who are prone to report for "repeats" of some stock innocuous "stomachic" mixture at fortnightly intervals over a period of years. Man has an inborn craving for medicine, and it has been pithily remarked that this desire for the continual taking of

medicines is one of the attributes which distinguishes genus *Homo* from the other Primates.

Incidentally it does not seem likely that this peculiar characteristic would be lessened by the provision of "free medicine" at the expense of the community, unless very carefully safeguarded.

Prevention of abdominal neurosis obviously depends on a clear appreciation of the ætiological factors producing symptoms when the patient is first examined, accurate diagnosis being thus ensured. Were this service possible in all out-patient departments of public hospitals, the unfortunate "Rpt-Mist" habit might be nipped in the bud, and the abdominal neurotic cease to preempt so much of the energy of the out-patient physician.

Disease of Central Nervous System.

In disease of the nervous system functional symptoms may coexist with, be superimposed upon or simulate organic disease to an extent which may render exact diagnosis a matter of extreme difficulty.

It would be out of place to trespass here on the field of the psychiatrists by venturing into the mysteries of psychosomatic transfer, which is in a sense the antithesis of the disturbance of function and inhibition that follow as a sequel to organic disease, the mechanism of the present study being of the nature rather of a somato-psychic transference.

In the presence of clearly defined organic disease—for example, disseminated sclerosis or *tabes dorsalis*—it is not uncommon to find a large element of functional superimposition on an organic basis. The extraordinary variability of symptoms found in the subjects of disseminated sclerosis has been tentatively explained on these grounds by Hurst and others.

It is indeed pertinent to speculate whether some of the results reported from certain sources in the treatment of cases of long-standing poliomyelitis and variously attributed to removal of "mental alienation of muscle", "incoordination", "spasm" and other ill-defined factors may not in part be explained by elimination of functional inhibition by psychotherapeutic methods consciously or subconsciously applied. It is perhaps unwise to embark here upon an issue so controversial.

There can, however, be no doubt that in relation to affections of the nervous system conditions may arise in which disability primarily organic may ultimately become functional. The signs of organic disease may disappear entirely or the residual lesion may be sufficient to leave some evidence of organic change without appreciable loss of function, or to leave both physical signs and functional impairment. The differentiation may prove to be of extraordinary complexity, but is often clarified by careful clinical observation and recognition of the discrepancy which frequently exists between the symptoms complained of and the anatomical structure or physiological processes of the body.

Respiratory Disease.

Phenomena comparable to those already studied may be observed in relation to respiratory disease. It is, for example, a common experience that in chronic asthmatic subjects an acute attack may be precipitated by nervous or emotional stress, the susceptibility of the individual becoming constantly increased by an oft-repeated stimulus. The perpetuation of cough not infrequently observed in patients convalescent from pertussis has been cited as an example of the phenomenon of facilitation, the organic changes associated with the acute disease having lowered the threshold value for reflex cough from bronchial irritation so that a subliminal stimulus becomes adequate to perpetuate spasmodic cough, over a prolonged period. A comparable mechanism—the lowering of the threshold value for adequate stimulus—may be responsible for the persistence of painful symptoms in systemic disease in many conditions, the commonly observed occurrence of cardialgia in association with gall-bladder disease being a familiar example.

Compensation Neuroses.

This study would be incomplete without reference to workers' compensation—a field in which the phenomena discussed reach the greatest fruition.

In the field of industrial medicine the peculiar complexities of "compensation neurosis" may be dependent on conscious or subconscious mental reaction to injury with disturbance of function following as a result.

It is widely recognized that advanced social legislation by which the amount of monetary compensation is determined by the duration of the disability, not infrequently tends to prolong the period of invalidism of an "injured worker" by aiding the development of traumatic neurosis.

It is important, however, to differentiate clearly between functional disorder due to psychic inhibition associated with exaggerated belief in the extent of the injury, and aggravation or simulation of symptoms by malingering engendered by the possibility of equating bodily injury with monetary compensation.

Difficulty is particularly prone to arise in cases of head injury in which purely subjective symptoms, headache, dizziness *et cetera* may be persistent over an indefinite period, often terminated only by completion of legal processes—litigation neurosis.

As a solution of these problems it has been suggested by Brain and other writers that the term "workers' compensation" might with advantage be altered to "industrial rehabilitation" and that medico-legal issues should be determined with the help of well-constituted medical boards with power to coopt specialist advisers, and working in close collaboration with "rehabilitation units" or the patient's private medical attendant, where adequate facilities existed to carry out all necessary methods of rehabilitation. Under such a plan adequate sustenance would be provided for persons injured in industry for such time as was thought by a competent board to cover the worker's disablement; it would ensure also the patient's full cooperation in his rehabilitation. The stress would thus be transferred from monetary compensation to efficient rehabilitation and the unfortunate experiences of conflicting medical evidence in judicial hearings might be largely eliminated.

As this aspect of the subject has vast medico-legal and political implications, it cannot be pursued further here, as we are primarily concerned with the purely scientific approach to the development of traumatic neuroses. It can, however, be generally agreed without equivocation that the development of neurosis following injury would be minimized under a system which ensured accurate pathological diagnosis with efficient treatment and the establishment of rehabilitation measures at the earliest possible moment after the receipt of injury.

A review of all these observations seems to make it clear that principles in common may underlie the perpetuation of symptoms originally organic, on a functional basis in a wide range of systemic diseases and as a result of trauma. This theme could readily be elaborated and expanded from the profundity of experience of any general physician.

Conclusions.

Certain conclusions appear clearly to emerge from what has of necessity been a cursory survey of an important field of clinical medicine:

1. Functional disorder is prone to arise as a sequel to organic disease and may, if unrecognized, become perpetuated by the ultimate development of secondary pathological tissue change—for example, disuse atrophy, foot-drop, fibrous tissue contractures.

2. Exact anatomical and pathological diagnosis with clear recognition of all ætiological factors is of particular importance where functional disability becomes superimposed upon symptoms of organic origin.

3. Functional symptoms are liable to be induced, aggravated or perpetuated as a result of suggestion or mental inhibition in susceptible individuals, over-prolonged bed-rest being an important ætiological factor.

4. Psychotherapy in its simplest form by logical explanation may prove effective in control of symptoms produced by suggestion or mental inhibition.

5. Traumatic and litigation neurosis in industry might be minimized by rational methods for rehabilitation of the "injured worker", as distinct from the concept of equating physical injury with monetary compensation, determined by the duration of the disablement.

Furthermore, it is obvious that there is definite relationship between human personality, constitutional "make-up" and the development of symptoms in disease.

In this address no pretension has been made to originality; rather has it been intended to redirect attention to an interesting and somewhat neglected aspect of clinical medicine, to find, as it were, "a common denominator" for the explanation of persistent diverse symptoms of functional origin in relation to organic disease.

If some of the ideas presented have appeared provocative and as such stimulating for further thought, this review of the matter may have proved not devoid of useful purpose, nor unworthy of the occasion upon which it has been my privilege to speak.

THE TYPING OF BACTERIUM TYPHOSUM.

By GLEN BUCKLE,
Pathology Department, Alfred Hospital, Melbourne.

IN 1938 Craigie and Yen[1][2] described a method which made possible the division of *Bacterium typhosum* into a number of types. The method depends on the action of a bacteriophage on the *V* form of *Bacterium typhosum*. A young broth culture of the organism cultivated from a patient or carrier is spread on an agar plate, and predetermined amounts of a number of phage preparations are "spotted" on the culture. After incubation the plate is examined. The number of bacteria used in the inoculum is intended to produce a confluent growth in the absence of bacteriophagy. If the bacterium displays some degree of sensitivity to a phage, then the sheet of bacterial growth is broken by a greater or less number of phage plaques, which in the case of a fully sensitive organism will be so numerous as to be confluent. Most organisms are identified by this single test.

From time to time suggestions have been made that bacteria might be classified by means of bacteriophages—either by the varying effect of a series of phages on different strains of bacteria, or by the recognition of the phages carried by lysogenic bacteria; but these methods, if used at all, have not found a wide application.

Craigie and Yen's method is unique, in that it employs not a number of phages, but a number of variants of one phage. These workers had previously described four types of phage specific for the *V* form of *Bacterium typhosum*.[3] One of these (phage II) showed in addition the property of developing a high specificity for the strain of *Bacterium typhosum* on which it was propagated. Differences of the order of one million were found in the numbers of plaques produced on the homologous and heterologous strains of bacteria by a phage II preparation. At the same time, on transfer to another strain of *Bacterium typhosum*, the phage lost its specificity for the former strain and displayed an affinity for the new strain.

The examination of a large collection of strains of *Bacterium typhosum* with two such phage II preparations enabled Craigie and Yen to characterize two groups of strains resembling, in their susceptibility to the phages, the strains used in preparing the phages. Transfer of the phage to a strain of bacteria relatively insusceptible to the former phage preparations furnished a new phage-preparation, which was in turn used to separate a third group of bacteria. This process was repeated, each group of strains being regarded as representing one type of *Bacterium typhosum*. Finally there remained only a group of strains which showed at most a transient lysis with phage II, and from which no specific potent preparation could be obtained. These strains were referred to as "imperfect *V* forms", this term being intended only to denote imperfect sensitivity to phage II, since no other peculiarity was demonstrable at that time.

The working hypothesis evolved to explain these phenomena was that a number of types of *Bacterium typhosum* existed, and that phage II consisted of a number of variants with affinities for different types of *Bacterium typhosum*. Propagation of the phage on any strain resulted in the multiplication of the variant having an affinity for strains of that type. At the same time variant phage particles appeared in smaller numbers. This hypothesis explains the ability of the phage to adapt itself to bacteria of heterologous type, the high titre for strains of homologous type, the lower titres for the various heterologous bacteria, and the constant ratios between these titres.

At the time of first publication of the method, 625 strains had been tested and assigned to eleven types, designated *A*, B_1, B_2, *C*, D_1, D_2, *E*, *F*, *G*, *H* and *L*.

Craigie and Yen adopted as the standard strength for phage preparations used in typing, the highest dilution of phage which produced confluent lysis of the homologous bacterium. This they called the critical test dilution. It was one thousand times stronger than the dilution which produced an average of one plaque on the homologous bacterium (the titre). When the critical test dilution is applied to a bacterium, there is usually no sign of action over the areas on which the heterologous phages have been placed. However, type A organisms were fully susceptible to all the variants of phage II (and were usually recognized by this property without special test with phage *A*); phages B_2 and D_2 acted almost as strongly on bacteria of types B_1 and D_1, respectively, as on their homologous organisms, while B_1 organisms showed slight to pronounced reactions and type *C* organisms showed very slight reactions with several heterologous phages (see Figure III, Yen[4]).

In 1939 Craigie subdivided types *E* and *F*.[5] In 1940 type *M* was described by Helmer *et alii*.[6] At this time Craigie's list contained in addition types B_3, B_4 and D_3. Felix has since described four new types.[7]

It was noticeable that the scheme was growing more complicated, particularly in respect to the repeated subdivision of types *B* and *D*. In addition, two disquieting facts had been recorded. Craigie recovered a type *A* colony from a plating of the B_1 type culture,[8] and Helmer *et alii* isolated both type F_1 and type F_2 from one patient.[9]

In 1942 Craigie[10] published a modified schema as follows:

> In developing the methods of typing strains of *Bacterium typhosum* by means of type II ϕ, it became necessary to recognize certain subtypes B, D, E and F and to provide phage preparations for their identification. While the epidemiological significance of such subtype differences was in doubt, it has hitherto been necessary to depend solely on epidemiological observations to determine whether differences between subtypes were of practical value. More recently, various laboratory observations seem to have paved the way for a revised and simplified typing scheme. The more important of these observations are as follows:
>
> 1. Degradation of the V form may occur within the limits of the V or Vi form as it is generally defined. Subcultures of a strain may be a mixture of the original V form and degraded V forms derived therefrom.
>
> 2. Strains and the degraded V forms of any particular strain differ in the duration of their V phase in an actively multiplying culture at 37·5° C. This applies to V phase whether defined as (*a*) the period during which the organisms are resistant to agglutination by O serum or (*b*) the period of sensitivity to lysis by Vi phage; but there is not necessarily an absolute correlation between (*a*) and (*b*) when strains of different types are compared. When a certain critical population in a pure V form culture is reached, development of Vi antigen and sensitivity to Vi ϕ ceases or becomes negligible and the culture continues to grow in the W phase of the V form.
>
> 3. When ϕ II is transferred from one to another of certain clear-cut types (now designated α types), affinity for the preceding α type is lost. On the other hand,

when ϕ II has been grown on certain subtypes (now included in the β or γ types) the phage retains an affinity for that subtype and this persists indefinitely when it is transferred to α or other β types.

4. With improvements in method, an increasing number of "imperfect V form" strains, resistant to ϕ II and therefore untypable, are being found to contain symbiotic phage. Such forms can be produced from the α types by introducing such symbiotic phage.

5. It now appears probable that as a result of the phenomena referred to in 3 and 4 above, the early preparations of ϕ II had acquired an affinity for certain β and γ forms. Consequently the phage attacked and could be propagated on certain β and γ forms, and it became necessary to recognize subtypes B_2, B_3, B_4, D_1 and D_2. However, it has recently been found possible to eliminate affinity for these subtypes from ϕ II by special manipulations on a series of α types. Following this a new series of ϕ II preparations of increased specificity and limited in attack to the α types have been made and are now available.

The elimination of subtypes from the phage typing schema has simplified this schema and reduced the amount of laboratory work involved in typing. The schema, however, necessarily remains incomplete, pending the investigation of strains which cannot be typed with the new series of α phages now available. Such strains include (a) partially degraded α forms. As these become identified it will be possible to provide new α phage preparations which have an equal affinity for the undegraded and degraded α forms of a given type, e.g., the new ϕ F which does not differentiate subtypes F_1 and F_2. (b) β forms, of modified phage sensitivity and undetermined status. (c) γ forms, resistant to ϕ II, many of which carry symbiotic phage, the presence of which confers resistance to ϕ II.

The α types are *A*, *C*, *E*, *F*, *G*, *H*, *J* and *L*. Type *A* includes the former type B_1; types *E* and *F* are no longer subdivided. The β forms listed are B_2, B_3, B_4, D_1 and D_2, but of these, B_2 and D_1 are the only ones mentioned in other reports. D_1, like the γ forms, carries a symbiotic phage. Types D_2 and *M* are not mentioned in that paper.

Craigie's work has apparently been interrupted by the war, and nothing further has been published. Meanwhile most workers have adopted his suggestion and do not attempt to type β or γ forms.

This paper is concerned with the α types *A*, *C*, *E*, *F*, *G*, *H*, *J* and *L*; but for completeness, the few reports on β types are included.

Assessment of the Method.

Technique.

The usefulness of such a method will depend mainly on the presence of distinct types—that is, on the absence of ill-defined intermediates and on the stability of the types. However, the first requirement in using the method is a culture which is in the *V* form (one possessing the *Vi* or virulence antigen, in contrast to the *W* form, which lacks that antigen). The great majority of cultures of *Bacterium typhosum* are in the *V* form when isolated, but they exhibit different degrees of stability in this respect. Subcultures are commonly a mixture of the two forms, from which the *V* form can be reisolated. Only 5% of strains have remained untyped because this requirement could not be fulfilled.

Type *A* organisms react with all the testing phages. Organisms of types *E*, *F*, *G*, *H*, *J* and *L* react only with the homologous phage when the critical test dilution is applied. In regard to type *C* organisms, Craigie[10] stated that the ratio

$$\frac{\text{Number of plaques produced on the homologous organism}}{\text{Number of plaques produced on type } C \text{ organisms}}$$

varied between $7{\cdot}5 \times 10^2$ and $2{\cdot}5 \times 10^3$ in a large number of preparations of phage II. In practice the area of lysis produced by type *C* phage, about one centimetre in diameter, is contrasted with the one or two plaques, one millimetre in diameter, which may be produced on type *C* organisms by the heterologous phages. The suppressed (β) types show greater cross-reactions, some approaching equality with the homologous reaction; but the clarity of distinctions between types does not rest merely on a judgement as to whether a reaction is complete or partial, but is intensified by the fact that the relationship between bacteria of different types and the different phages is not reciprocal. One of the least striking relationships, for example, is the following:[11] phage D_2 acts on D_1 organisms at a strength ten times the titre, but phage D_1 does not affect D_2 organisms at 1,000 times the titre. These distinctions are easily demonstrated by ordinary technique. No one has recorded difficulties in reproducing such results.

Stability in Vitro.

In the original papers Craigie and Yen[2] reported that a number of strains of types *E* and *F* had been reexamined after fourteen months and were unchanged in type. One hundred and forty-six strains, representing types *A*, B_1, B_2, *C*, D_1, *E* and *F*, had been reexamined after periods exceeding ten months, during which time several subcultures had been made; all had remained type-stable. Multiple colony isolations had not revealed any evidence of change of type. In 1940 Craigie[9] reported that intensive investigation of the type strains by repeated subculture and single colony isolation had yielded only one instance of change of type. A type *A* colony was isolated from a plating of the type B_1 culture. This is regarded now as a reversion from the degraded to the undegraded form. Yen[4] reported no change in type after storage for a year and a half with frequent subculture.

Craigie and Yen[2] examined some of the classical strains of *Bacterium typhosum*. The subcultures of "Ty 2" obtained from the Lister Institute and from the State Serum Institute at Copenhagen were both of type *E*. Subcultures of "Watson" from the same sources were both of type *F*. Yen[4] examined the subcultures of these strains maintained at Peiping: the "Ty 2" strain was of type *E*, but the strain labelled "Watson" proved to be of type *A*. He makes no comment on his finding. Of the classical strains in general, one must suspect that in their long history of passage through many subcultures in various hands (usually in company with other typhoid strains), confusion might sometimes occur. It is likely that any substituted strain will not be of the same type as the original. Therefore one is inclined to give more weight to concordant than to discordant results. However, it may be significant that the apparent change was to type *A*.

Stability in Vivo.

Mouse Passage.—Strains "Ty 2" and "Rawlings" were tested by Craigie and Yen[2] after extensive mouse passage and found to be unchanged in type. Craigie[9] reported in 1940 that the type strains *A*, B_1, B_2, *C*, D_1, D_2, *E* and *F* had been "mouse passaged" under various conditions. With one exception the phage reactions of the strains remained unaltered. From one mouse inoculated with type *C* organisms a culture was obtained which showed a minor alteration in its phage reactions. Sixty single colonies were examined and one was of type *A*.

Repeated Isolations from the Same Subject.—Craigie and Yen[2] reported multiple isolations from 46 persons. Organisms of the same type were recovered from one subject nine times, from another subject five times, from two subjects four times and from eight subjects three times. Yen and Chen[11] reported the case of a urinary carrier who had been under treatment for a period of three years, and from whom type *A* organisms were recovered on numerous occasions. In the course of some experiments detailed in that paper, *Bacterium typhosum* type *A* was recovered from his urine nineteen times over a period of thirty-three days. Yen[12] also reported the results obtained with 30 specimens from 20 patients. All the suspicious colonies on the original plates (6 to 24; in 19 cases more than 10 colonies) were examined. In every instance the different colonies isolated were of the same type, if of *V* form. In two cases only the imperfect *V* form was found and in one case only the *W* form. Dolman *et alii*[13] reported the isolation of type B_2 organisms from 22 consecutive specimens of fæces from a carrier over a period of ten weeks. Foley[14] stated that were multiple

typing was carried out, in his series, the cultures remained true to the original type except in five instances, in which it became impossible to type them. Felix[7] stated that strains repeatedly isolated from carriers over long periods did not show any change in type, though such strains often showed degeneration to the imperfect *V* form or to the *W* form.

Uniformity of Type in an Outbreak.—Craigie and Yen[2] reported on the examination of strains from 21 outbreaks, 12 in Canada, six in England and three in Scandinavia. From two to 44 strains were examined, and only a single type was found in each outbreak. The types concerned were *A*, *C*, *E*, D_1 and *F*. Helmer *et alii*[6] reported that in the examination of 68 strains, not more than a single type was found in any group of cases epidemiologically related, with the exception of the recovery of types F_1 and F_2 from one patient. Craigie now regards these as the degenerated and undegenerated forms of the same type. Brandon[12] examined 36 strains from an epidemic, in which the vehicle of infection was believed to be milk. All were of type F_2. Craigie[3] reported thirteen F_2 strains from a milk-borne epidemic. Meyer[16] examined strains from 88 patients infected by the medium of cheese; all were of type *C*. Desranleau[17] reported three groups of strains, each group apparently homogeneous—(*a*) 30 β type, (*b*) 21 β type, (*c*) 11 γ type.

Identity of Carrier and Case Strains.—Not included in the results given above are fifteen outbreaks reported by Craigie and Yen[3] in which the source of the infection was traced. Passage from carrier to patient or from patient to patient was observed with organisms of type *A*, B_1, B_2, *C*, D_1 and *F* without change of type. A series of transfers has been observed on four occasions, as follows: (i) In one of the outbreaks reported by Craigie and Yen,[2] four cases of infection by type *C* organisms were attributed to a person from whom no culture was available. One of these four patients infected a fifth person, from whom type *C* organisms were recovered. This patient infected a sixth person, whose organisms were also shown to be of type *C*. (ii) Foley[18] reported the following incidents. A grandmother, carrier of type *F* organisms, infected at various times three visiting relatives. The organisms recovered from these patients were of type *F*; one of the patients, an infant, passed the infection on to her nursemaid, whose infecting organism was also shown to be of type *F*. (iii) Lazarus[19] described an epidemic caused by the consumption of chocolate *éclairs* contaminated by a carrier of type F_1 organisms. Among the patients was a child who infected his mother. The strains from both these patients were of type F_1. (iv) Two members of the nursing staff of the hospital in which the patients reported by Gell *et alii*[20] were inmates developed typhoid fever. No culture was obtained from one nurse, but the other was shown to be infected by type *C* organisms. The organisms recovered from the patients and from the carriers from whom their infection was derived were of type *C*. Lazarus[19] also records the transfer of type *J* to a grandchild, and of types not specified (*a*) from a rancher, by means of milk, to two patients, (*b*) from a hostess to her visitor, and (*c*) from a carrier to two patients. Wyllie[21] has recorded the transfer of types *F* and *C*, Felix[7] the transfer of type *J*; Allen[22] has recorded the transfer of type F_1 to a single subject and of type *C* from a carrier, who assisted in a dining room, to 27 persons; Menzies[23] has recorded the transfer of type *E* by cheese to six patients, Schlesinger[24] that of type *A* from two carriers by means of food to four patients, and Gauthier and Foley[25] that of type D_1 by cheese to thirty patients. Ward[26] stated that in his experience the typing procedure suggested transfer from wife to husband once, from grandmother to grandchild three times, and from mother to child once. Felix[7] stated that all cases of infection from the same source were found to have been caused by the same type of organism. An apparent exception to this was an outbreak in a large industrial city, in which all the patients had evidently contracted the infection from the same source, a butcher's shop. The patients had been treated in a number of hospitals and cultures were received for typing from three laboratories. Two laboratories sent only cultures of type E_1, but the third laboratory sent only cultures of type F_2. It was not possible to obtain more specimens. One must agree that this finding is probably due to an error in handling the cultures. It may be appropriate to mention here another group of cases discussed by Craigie and Yen.[2] Four members of a family were infected. From three of them type *A* organisms were isolated on one or more occasions. From the fourth patient type *A* organisms were isolated on two occasions, but the third culture from this patient was recorded as of type *C*. Craigie and Yen remark that error in numbering the strains could not be excluded, and note that the strain immediately preceding this one in their series was of type *C*.

Sporadic Cases.—It has been possible to demonstrate in a few instances that a case thought to be sporadic was caused by organisms of a type different from that concerned in a concurrent outbreak. A number of strains were examined by Craigie and Yen[3] which had been isolated during the Croydon epidemic. One strain was of type *A*; the Croydon epidemic was caused by organisms of type D_1. Inquiry into this apparent discrepancy disclosed that the type *A* case was not considered to be connected with the epidemic. (This is the only instance in the literature in which conclusions rested on a distinction drawn between an α and a β type.) Menzies[23] observed a sporadic case caused by type *A* organisms occurring at the time of a type *E* outbreak spread by contaminated cheese. Gardner[27] reported a case due to type *A* organisms occurring in another suburb, just as the Moorabbin (type *E*) epidemic was subsiding, in a person who had been in contact with Moorabbin residents. It was feared before the organism was typed that this case might herald the appearance of a secondary outbreak. Craigie and Yen[3] recorded as possibly throwing doubt on the reliability of their method the occurrence of a case of typhoid fever due to type *E* organisms in the same locality and at the same time as six other cases, five of which were due to type *C* organisms. From the sixth person no culture was available. However, the source or sources of the infections could not be demonstrated, and it was compatible with the facts to regard the type *C* infections as being derived from the last-mentioned person, and the type *A* case as sporadic.

Mixed Epidemics.—Felix[7] referred to an outbreak investigated by Fry in which type E_1 and type *C* organisms were recovered from the patients. A search resulted in the location of the corresponding carriers. In Craigie and Yen's original paper an outbreak is mentioned which is described more fully by Brandon.[12] Nineteen cases of typhoid fever occurred between October 18 and December 25, 1937. One patient (Case VIII) was a fisherman; sixteen other patients remembered having eaten cooked crabmeat, the original supplier of which was a fisherman living on a houseboat in the same locality as the patient in Case VIII. The cooked crabmeat had been washed with city tap water brought from the shore in buckets, but it was found that the utensils were sometimes contaminated with sea water. The sea water was examined and three strains of *Bacterium typhosum* were isolated, type E_1, type *A* and an "imperfect *V*" form. Cultures from twelve patients were typed as follows: *A* (six), D_1 (one), E_1 (two), *G* (one), *H* (one) and "imperfect *V*" form (one). Brandon suggested that when in a typhoid epidemic patients are infected by more than one type, or patients are infected by different types of *Bacterium typhosum*, the epidemic has probably resulted from sewage contamination.

Second Carrier.—In addition to the type *A* cases mentioned, Schlesinger[24] reported strains of type *C* obtained from infections occurring at about the same time, which were derived from contaminated cheese. A search through the suppliers of milk to the cheese factory resulted in the location of a carrier who appeared to have caused the outbreak. However, the organisms cultivated from him were not of type *C*. A second search disclosed the carrier of type *C* organisms.

Separation of Apparently Related Cases.—Gell *et alii*[20] reported the following circumstances. Infection of one

girl was at first thought to be associated with that of her sister, who had suffered from typhoid fever a few months before; but one organism was found to be of type *C* and the other of type E_1. The girl worked in an institution already suspected to have been the source of infection of another patient (type *C*); four carriers of type *A* organisms and three of type *C* organisms were found in the institution.

Outbreaks Apparently Separate but Arising from One Source.—The most interesting study by Bradley[35] of cases caused by organisms of a new type (D_4) cannot be adequately summarized. The combination of a rare type of organism, a carrier on a dairy-farm who apparently only rarely infected the milk, and the distribution of the milk in different localities on different occasions, gave rise to a series of cases widely separated in space and time. Information obtained by typing of the organisms was essential to the discovery of the facts. The position of this new type in relation to Craigie's present schema was not defined. From the designation it would seem to be a β type.

Comment.

The results reported above are collected in Table I. The figures indicate the number of persons from whom cultures were obtained and subjected to the typing procedure. Most authors have tested more than one culture from many patients. The nomenclature is that used by the authors cited, with the following exceptions: Yen[41] reported two new types, P_{15} and P_{16}, from Peiping (eight strains of P_{15} and seven strains of P_{16})—these are included in the "imperfect *V*" forms; Felix[37] later separated from his "imperfect *V*" forms cultures of four new types—19 strains of type D_1, one strain of type D_2, six strains of type L_2, and 23 strains of type 91. Types D_2 and *M* were not mentioned in Craigie's latest schema. They are included with the β and γ forms in the calculation of the totals.

Types *A* and *E* have been common in all surveys. Types *C* and *F* have usually formed a large proportion of the cultures tested. Though the rarer types *G*, *H*, *J* and *L* have not been found in all countries, the numbers of cultures tested have not been large enough to exclude their presence. One or more of these rarer types have been found in Canada, in the United States of America, in China and in Australia (the two strains of type *J* reported by Felix originated from a carrier who acquired the infection in Egypt). Possibly all will be found in any large survey, but even so there is room for local peculiarity in distribution; for example, Yen did not find the common types *C* and *F* in Peiping, but the rare types *G* and *H* were present.

Experimental Investigation.

The typhoid epidemic occurring at Moorabbin, Melbourne, in 1943,[39] which involved 413 cases in a population of 4,500, brought home to us the great practical importance of the bacteriophage method in the epidemiology of typhoid fever. It was decided to investigate the method and to type all available Australian strains. Through the courtesy of many physicians and laboratory workers nearly 100 cultures were collected.

Type strains and phage II preparations were first obtained from Major T. C. Backhouse. They comprised most of those in use prior to the publication of Craigie's new schema. The work was done with a set of phages derived from the F_2 phage, propagated on the α type strains. A subculture of "Ty_2" obtained from the Commonwealth Serum Laboratories was used as the *E* type strain. It was sensitive to the *E* phage of the original set, and was of the same type as strains from the Moorabbin epidemic (type *E*).[37] No attempt was made to type β or γ strains, nor to differentiate between types *A* and B_1, E_1 and E_2 or F_1 and F_2.

The results are set out in Table II. Ninety-seven strains have been tested: 28 could not be typed; of the remaining 69, 38 were of type *E*, 19 of type *A*, seven of type *F*, four of type *C* and one of type *L*. A great majority of the strains which could not be typed were stock cultures.

Most of the strains came from sporadic cases. The 66 Victorian strains came from 43 outbreaks, twenty due to type *E*, thirteen to type *A*, one to type *C*, one to type *L* and eight to organisms not typed.

Cultures from associated cases were of the same type, if they could be typed. Similarly, strains from carriers and from subjects infected by them were of the same type. Strains 19 to 28 were from a group of patients and carriers, inmates of the same ward in an institution. Strains 19 to 26 were of type E, strains 27 and 28 could not be typed. Strain 59 came from the carrier concerned in a later outbreak in the same institution, when the subjects who provided strains 55 to 58 were infected. These strains were all of type *E*. At this time the subjects who provided strains 20 and 25 were retested and found to be excreting the same type of organisms as twenty-two months before. The patient from whom strain 41 was obtained was infected by type *A* organisms; his grandfather (who pro-

TABLE I.

Author.	Locality.	α Forms.									Other *V* Forms.					*W* Forms.	Totals.
		A		*C*	*E*	*F*		*G*	*H*	*J*	*L*	B_2	D_1	D_2	*M*	Imperfect *V*, β or β and γ	
		A	B_1		E/E_1	F/F_1	F_2											
Craigie and Yen.	Quebec.	24	14	63	120	26	—	—	—	—	—	21	21	—	—	20	16	334
Craigie and Yen.	Rest of Canada.	23	7	25	32	30	—	2	2	4	—	16	11	—	—	27	11	190
Craigie and Yen.	England.	17	—	8	14	2	—	—	—	—	—	1	22	2	—	4	4	74
Craigie and Yen.	Norway, Sweden and Denmark.	3	—	5	1	5	—	—	—	—	—	2	2	—	—	4	2	24
Wyllie.	Canada.	—	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—	4
Yen.	Peiping.	15	—	—	16	—	—	3	1	—	—	—	5	—	—	30	8	78
Helmer *et alii*.	Canada.	14	1	3	13	5	14	3	1	—	—	1	6	—	7	5	8	81
Lazarus.	Western United States of America.	54	14	40	83	68	—	—	1	8	1	36	17	1	1	27	26	377
Crossley.[39]	Ontario.	40	—	47	130	59	—	—	—	11	—	—	—	—	—	42	26	355
Desranleau.	Quebec.	8	—	37	35	11	—	—	—	—	—	—	—	—	—	102	7	200
Schlesinger.	New York.	6	—	24	—	—	—	—	—	—	—	—	—	—	—	1	—	31
Felix.	England.	83	—	43	93	16	3	—	—	2	—	5	15	17	—	117	7	401
Felix.	Scotland.	10	—	1	16	—	9	—	—	—	—	—	1	—	—	1	1	39
Foley.	Canada.	—	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—	4
Meyer.	California.	—	—	83	—	—	—	—	—	—	—	—	—	—	—	—	—	83
Menzies.	Canada.	1	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	8
Gell *et alii*.	England.	4	—	—	9	1	—	—	—	—	—	—	—	—	—	—	—	14
Total		338		390	561	254		8	5	25	1	82	100	20	8	389	116	2,297
Percentage		14·7		16·9	24·4	11·0		0·3	0·2	1·1	0·05				26·1		5·1	

TABLE II.

Strain Number.	Type.	Locality.	Date.	Strain Number.	Type.	Locality.	Date.	Strain Number.	Type.	Locality.
1	*E*	Chelsea.	1930	35	*A*	Caulfield.	1945	73	*E*	Marrickville.
2	*E*	Collingwood.	1933	36	*E*	Northcote.	1945	74	—	Parramatta.
3	*E*	Middle Park.	1934	37	*E*	Eltham.	1945	75	*F*	Auburn.
4	*L*	Ferntree Gully.	1937	38	*A*	Werribee.	1945	76	—	Auburn.
5	*A*	Coburg.	1937-1938	39	*E*	Brighton.	1945	77	—	
6	—	Box Hill.	1939	40	*A*	Institution B.	1945	78	—	
7	—	Mitcham.	1940	41 and 42	*A*	Ferntree Gully.	1945-1946	79	—	
8	*A*	Kooweerup.	1940	43	—	Footscray.	1946	80	—	
9	*E*	Burnley.	1941	44	—	Institution C.	—	81	—	
10	*A*	Footscray.	1941	45	*E*	Institution C.	—	82	—	
11	*E*	Glenferrie.	1942	46	—	Institution C.	—	83	—	Strains from the Salmonella collection at the Institute of Medical and Veterinary Science, Adelaide.
12	*E*	Ballarat.	1943	47	*E*	Mansfield.	1946	84	*F*	
13	*A*	Essendon.	1943	48	*E*	Edithvale.	1946	85	*F*	
14	*E*	Mansfield.	1943	49 to 53	*A*	Heidelberg.	1946	86	*E*	
15	*E*	——	1943	54	*A*	South Melbourne.	1946	87	—	
16 and 17	—	Brighton.	1944	55 to 59	*E*	Institution A.	1946	88	—	
18	*E*	Carnegie.	1944	60 and 61	*C*	Institution D.	1946	99	*A*	
19 to 28	*E*	Institution A.	1944	62 and 63	—	Institution A.	1946	90	*F*	
29	—	Sunbury.	1945	64 to 66	*E*	Pascoe Vale.	1946	91	—	
30	*A*	Albert Park.	1945	67 and 68	*E*	Brisbane.	1944	92	—	
31	*E*	Northcote.	1945	69	*E*	Brisbane.	1944	93	*C*	
32	*A*	Coburg.	1945	70	*F*	Brisbane.	1944	94	*F*	
33	*A*	Auburn.	1945	71	*C*	Dungog.	1944	95	—	
34	*E*	Mentone.	1945	72	*F*	Sydney.	1944	96	—	
								97	—	

vided strain 42) was found to be excreting organisms of the same type. The subjects who provided strains 49 to 52 were members of one family, but represented several branches whose point of contact was one home. It was found that a member of that household, who in the meantime had died with symptoms compatible with a diagnosis of typhoid fever, had previously been staying in the country. Investigation there disclosed a carrier of organisms of the same type (*A*) as were recovered from the patients. The subjects from whom strains 60 and 61 were obtained were respectively the carrier, an inmate of an institution, and an employee whom he infected; in both cases the organisms were of type *C*. The subjects providing strains 64 to 66 were a family group, an elder member of which was the carrier; these three strains were of type *E*. Strains 67 and 68 were type *E* strains cultivated from two sisters. The remainder of the strains were not known to be related. Most were from isolated cases, some were the only available representatives of larger outbreaks. Little information was available about some stock cultures; for example, strain 1 was reputed to be from an epidemic at Chelsea in 1930, but no record could be found.

Discussion.

The methods in common use for typing bacteria are based either on some peculiarity in the metabolism of an organism or on some form of the antigen-antibody reaction. Each new development along these lines receives some support from the known reliability of similar methods. The position is different with phage typing methods in general, and with this method in particular. When phage typing methods have been suggested in the past, evidence has usually been given that the results obtained with them paralleled the results obtained with some established method. Paradoxically, this practical identity of results is presumably the reason why such phage typing methods have never been extensively used. In the case of Craigie and Yen's method there is no parallelism with the results of serological or biochemical tests. Craigie and Yen were unable to find any serological differences between the phage types, while Yen[21] found no correlation between the phage types and those fermentation reactions of *Bacterium typhosum* which vary within the species. There is, of course, no difference in the habitat of different types, nor have any differences in clinical signs been reported. Though the method can be tested to some extent by laboratory procedures, and must satisfy the requirement that the types shall be stable (or if they are not perfectly stable, that the direction and extent of variation must be known) and clearly differentiated from one another, the main check on its value must be direct comparison of results obtained by it with epidemiological observations. Furthermore, it may be that similar phage typing methods can be applied to many other organisms; in fact, Wilson[20] has recently published a phage typing scheme for *Staphylococcus aureus* which employs in part this phenomenon of "adaptive specificity" of a phage for a particular type of bacterium, while Felix and Callow[22] used a similar phenomenon in typing *Bacterium paratyphosum* B.

In consequence of these two points—the novelty of the method and its potentiality as a prototype of similar methods—it is argued that it should be subjected to especially critical examination. All the available cultures should be tested; this will, in addition, define the types endemic in a locality, indicate possible sources of infection of sporadic cases, eliminate some carriers from suspicion and show when other types are imported.

The types have a world-wide distribution. The three groups (α, β, γ) into which the *V* forms are divided comprise 95% of all cultures examined. There are 5% of *W* forms, to which the test is not applicable; it might be possible to rejuvenate these by "mouse passage" and recover cultures which could be typed.

The γ forms are derived from the α types. It does not seem likely that their original types can be ascertained by a direct method. It might be possible to characterize these strains by the phages which infect them;[17] but that method is different from the one under discussion. Strains of this kind will probably be encountered in any bacterial species. Their importance will not depend directly on the proportion of lysogenic strains encountered in a species, but on the relation between the phages infecting them and those available as typing agents.

Insufficient information has been published about the β types to justify discussion. It must be borne in mind that the method had been in use for some time before the existence of such strains was realized, and indeed before the explanation of the behaviour of the "imperfect *V*" forms was perceived.

Of the cultures tested, 69% have been assigned to the α types. The differences between strains of *Bacterium typhosum* which serve to define the α types are easily observable. Lesser differences are demonstrable (for example, between types F_1 and F_2), but are subject to variation and therefore unsuitable for use in epidemiology. One possible change of type on subculture (type *F* to type *A*) and an apparent change of type on "mouse passage" (type *C* to type *A*) have been recorded. Change of type is at least a rare occurrence; only further observation can show whether it really occurs and whether the change is always to type *A*.

The results of the application of the method are good. Only three instances have been recorded of results which

fail to substantiate it. Two of these appear to be due to error; the third is open to a satisfactory explanation.

In all other instances reported, the results obtained agreed with epidemiological observations, whether typing supplemented these observations or gave unexpected results which were later confirmed by the epidemiologist.

A Request.

The writer would be glad of the opportunity to examine any strains which are or which become available. Laboratory workers are urged to send cultures immediately after isolation.

Summary.

1. The literature concerning the phage typing of *Bacterium typhosum* by the method of Craigie and Yen is reviewed.

2. The results obtained by various authors are collected, and it is shown that of 2,297 strains, 5% were *W* forms, to which the test is not applicable, while 95% were *V* forms which could be placed in three groups (α, β, γ).

3. The γ forms are strains infected by a phage (or phages) which confers resistance to the typing phage. The β forms are types formerly recognized, but at present, following the discovery of a fallacy in the technique formerly used, of unknown status. These two groups, with some new types not yet assigned to a position in the schema, constitute 26% of the strains.

4. Sixty-nine *per centum* of the strains have been placed in the eight α types. Four of these types are rare, four are relatively common. They are widely distributed, but no one author has encountered all of them in a given locality.

5. Evidence is given to show that the α types are distinct and stable. There is identity of type between carrier and case strains; in most outbreaks only one type of organism is isolated; on occasions, organisms from sporadic cases have been shown to be of different type from those concerned in a concurrent epidemic. Instances are given in which typing showed that (*a*) apparently related cases arose from more than one source, (*b*) apparently separate cases had a common origin, (*c*) the carrier first suspected had not caused the epidemic being investigated.

6. Ninety-seven Australian strains have been tested; 28 could not be typed, 38 belonged to type *E*, 19 to type *A*, seven to type *F*, four to type *C* and one to type *L*.

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LOOKING BACKWARD: A QUARTER-CENTURY OF PÆDIATRICS. I: GASTRO-ENTERITIS.[1]

By D. GIFFORD CROLL,
Brisbane.

TONIGHT I am asked to look back twenty-five years, and I am going to take the liberty of looking back further, to 1910, when I first joined the staff of the Brisbane Children's Hospital.

The first difference which I note is the absence today of those excellent and valuable annual reports and medical statistics which were published by the committee of that time.

I have chosen as the subject of my remarks gastro-enteritis in children under the age of two years, because it is in that disease that I see the most dramatic changes. Gastro-enteritis was the most dreaded of all diseases of infants in those days, as the figures in Table I will readily demonstrate. Nor was the situation in domiciliary practice any better. I can recollect many a hopeless fight to save a baby's life, such as we seldom see today. In particular I recollect the death from gastro-enteritis of one child, aged under two years; when the parents returned from the funeral they found their other child, aged four years, ill of the same disease; that child also died within a day or two. Again I recollect an outbreak of the disease in an infants' home established by some philanthropic ladies. There were 15 infants in the home, and in a short time 12 of them had died and the other three were removed. I think you will agree that such things do not happen today.

TABLE I.
Gastro-Enteritis in Children Aged under Two Years, Hospital for Sick Children, Brisbane.

Date.	Admissions.	Deaths.	Mortality Rate per Centum.
1908	68	42	62
1909	123	60	49
1918	183	59	33
1920	295	111	37
1944–1945	296	9	3
1945–1946	338	7	2

What did we know about the disease and what was our treatment? We did not know what it was, and there were many theories. Microscopic examination of stools and cultures revealed many organisms, but none could be incriminated. Dysentery was discounted because the organism could seldom be found. In treatment the most generally accepted plan was avoidance of milk at all costs, and this I am sure was grossly overdone. These unfortunate babes were fed on water, albumin water, barley water and whey. Of drugs they were given oil, calomel and *Sodii Sulphas.*

Many weird forms of treatment were tried, notably sea water, which had to be collected from so many miles off the coast and was administered subcutaneously. This treatment was tried under strong pressure from the hospital committee, but was of no avail.

In 1920 a change occurred. Those of us who had been in the last war and served in the Middle East, when we returned, recognized many of the cases at once as of dysentery. We then realized that we had not discovered the organism because an attempt at culture of dysentery bacillus, to be successful, must be made from a very fresh stool—practically warm. We started to use antidysenteric serum, with dramatic results when the serum was given early enough.

This was the first real lift in the treatment of the disease. In those years we used to carry antidysenteric serum around with us in our bags, so as to give it at the first contact with a case. So dramatic were the results that I am convinced that, whether the organism can be found or not, the dysentery bacillus is the main criminal.

As the years went on the virulence of the disease appeared to lessen, and it became less necessary to use the antidysenteric serum. Within the last few years sulphaguanidine became available, and I suppose this accounts to some extent for the excellent figures of 1944-1945 and 1945-1946.

But that is not all—there must be another factor at work. I am sure that neither antidysenteric serum nor sulphaguanidine could have saved all the patients in 1908 and 1909, many of whom died within a few hours of admission to hospital. What is that factor? Improved hygiene? No. The hygiene of Brisbane has improved, but not to that extent. The earth closet system is still predominant—there are fly-breeding foci all over the city. The milk supply has improved, but not enough. You will note that the number of cases has greatly increased, so the infection is still present. In many homes you will see baby's food and utensils on a table swarming with flies and two or three flies in the milk jug.

Is it an increase in breast-feeding? Again no, because in those days it was well recognized that breast-fed babies did not often contract the disease, and the mere terror of it maintained nearly as high an average of breast-feeding as public education and propaganda have produced today.

I shall hazard one guess as to the factor which has brought about this great fall in the mortality rate: that is the addition of vitamins to artificial infant foods. Nearly all these babies were artificially fed. Prior to 1915 vitamins were unknown, and it was only in the 1920's that they came into general use. Nowadays a mother is taught that she must include vitamins in her baby's diet, and even if she does not add them deliberately she can hardly avoid giving them, as most of the artificial foods contain vitamins. I think this factor so increases the baby's resistance to the disease that any reasonable treatment gives it a decent chance of recovery.

[1] Part of a symposium held at a meeting of the Queensland Branch of the British Medical Association on July 5, 1946.

LOOKING BACKWARD: A QUARTER-CENTURY OF PÆDIATRICS. II: TWENTY-FIVE YEARS' RETROSPECT IN CHILDREN'S EYE WORK.[1]

By E. O. MARKS,
Brisbane.

LOOKING BACK over the last twenty-five years in the eye department of the Brisbane Children's Hospital has made me realize that considerable changes have happened in the eye work of the hospital in that time, though one was not conscious of the changes while they were taking place. There was a difference in the diseases as well as in the numbers attending in 1945 as compared with 1920, when I started as assistant to the late Dr. John Lockhart Gibson. In those days the in-patients were more numerous than in later years, and the out-patients less numerous. On one occasion we had 26 in-patients for a supposed 12 beds, and there were usually more than the 12. Of late I doubt if the average would have been half-a-dozen. There were always a number of patients with trachoma, all long-stayers, and generally two or three children with interstitial keratitis and one or two with ocular plumbism. Squints, corneal ulcers and so on had much the same incidence as at present.

Trachoma.

Early in 1929 the Queensland Government established the Wilson Ophthalmic School Hostel for trachomatous children, where they could receive schooling as well as treatment under the hygienic and educational conditions of a happy boarding school rather than the restricted if

[1] Part of a symposium held at a meeting of the Queensland Branch of the British Medical Association on July 5, 1946.

hygienic conditions of a hospital. Most of the children come from rough and often dirty home conditions, and the educational benefits are not limited to the classroom. A school hostel is much better for a child who is not ill and whose treatment is likely to extend over many months, if not a year or two. After the establishment of the hostel we kept only an odd trachoma patient at the Brisbane Children's Hospital, either because the child was too young for the hostel or to await a vacancy. As it happens, since 1932 I have also had the ophthalmic care of the children at the hostel. It is pleasant to be able to report that in the last twenty-five years there has been a marked diminution in the incidence of severe trachoma, at least in so far as such patients have come to the hospital or hostel. Children with trachomatous ulceration and pannus have of late been few and far between, and I have not for some years seen anything approaching blindness from trachoma in a child. While we still have trachomatous lids with scarring, it is long since any entropion operation has been called for.

The cause of this lessening of severity can only be surmised. Perhaps the treatment of the acute conjunctival conditions with the new drugs has been responsible; perhaps the less hygienic sections of the community, from which nearly all the cases come, have become more hygienic in their mode of life; perhaps the disease itself has become less virulent or the population more resistant. Who can say? There can be little doubt that the earlier care under favourable conditions provided by the hostel has contributed to the improved visual results in the children coming there. An investigation of the present position of trachoma in the west is desirable.

With regard to treatment, the twenty-five years' experience has convinced me that mildness should be the governing principle—a conclusion arrived at by trying the effects of differing treatment on each of the two eyes. It is long since I have used silver nitrate or copper sulphate. While the new drugs are extraordinarily good in dealing with the secondary conjunctival infections, trachoma itself still seems to require time as the chief factor in its cure—time and ocular and general hygiene.

The most dramatic success I had was with a child from Central Australia who had been under treatment by experienced ophthalmologists in two of the southern capitals over a long period. She came to the hostel still suffering from corneal ulceration and pannus with accompanying photophobia and blepharospasm. The poor child was so miserable and nervous that I said just to bathe her eyes with boracic solution for a few days until she was more at home. Her improvement was so rapid and maintained that there was never reason to change the treatment, and apart from atropine the boracic lavage was all the local treatment she received while in the hostel.

This patient may have had an idiosyncrasy to the treatment she had been receiving, or perhaps she came just at the right time, when she was going to get well anyway; but she certainly did wonderfully well on simple boracic lavage.

Interstitial Keratitis.

Twenty-five years ago we usually had in the hospital two or three patients with interstitial keratitis, and a common association with the eye condition was quiet synovitis of the knees. Sometimes the eye symptoms came first, sometimes the knee symptoms. Interstitial keratitis is not nearly so common now, and it is long since I have seen a patient with the associated synovitis.

Plumbism.

In 1920 and for many years afterwards ocular plumbism was common. One would find recent paresis of the lateral rectus and double papillœdema in a small, pale, sick-looking child with no pyrexia, usually a nail-biter, and sometimes with blue-lined gums and passing urine containing lead. There were, of course, other patients with foot-drop and wrist-drop; but only occasionally did the ocular symptoms occur in the same patient, and rarely at the same time. I remember one occasion when there were five children with double papillœdema in the ward at the same time. Four were suffering from typical lead poisoning and recovered; the fifth had an elevated temperature and meningitis, and died. When treated by repeated lumbar puncture to relieve the pressure on the optic nerve, most of the patients with lead poisoning recovered, with little or no impairment of vision, though in a few optic atrophy developed.

For many years now ocular plumbism has been so rare that one almost forgets to look for the disease.

Squint.

With the great increase in the out-patient attendances there has no doubt been an actual increase in the number of children with squint attending. This is probably due to the praiseworthy activity of the school health service in pressing the parents to have the children's eye defects attended to. I do not think the actual proportion of squints has increased. It will certainly diminish if the school authorities and medical men generally can impress on parents the urgent need to have the eyes properly examined on the first suspicion of a squint and the refraction corrected, instead of waiting to see if the squint will recover of itself and thus permitting the development of a permanent squint with its attendant disabilities.

At one time, shortly before the recent war, the Brisbane and South Coast Hospitals Board was urged to establish an orthoptic clinic at the Brisbane Children's Hospital, and the proposal was referred to me for my opinion. While there is no doubt that in carefully selected cases orthoptic training is of great benefit in the treatment of squint, in many if not in most cases such treatment can be of little if any use; the results depend on the child and on the child's parent, as well as on the child's eyes. Results of orthoptic treatment have been published; but I could find no comparable figures of results without orthoptic treatment to give the board in order to show the benefit of the proposed clinic. So I looked through my previous five years' cards, sorting out the squint cases and results, and to my surprise found that the proportion of unselected refractive squints cosmetically cured without orthoptic treatment was as high as that given in the published results with orthoptic treatment. The figures plainly were not comparable, because my patients had not trained binocular fusion, though it is likely that eyes which are straight will develop binocular fusion in the course of time. On the other hand, my patients were not selected and included many on whom no orthoptist would waste time. At that time each out-patient doctor's cards were kept separately, and my cards were kept available until the child was over age for the hospital. Alas! During the war the old cards were destroyed and the powers that be decided that cards would not be kept after four years and that all the cards would be mixed in one general index. The possibility of ever again dissecting out any needed figures of diseases or results has thus been destroyed.

Cataract.

The "epidemic" of congenital cataract with a history of German measles during pregnancy, recorded in Sydney and Adelaide, did not occur in Brisbane. There were a few cases of cataract with this history, but no more than the usual incidence, and the congenital cataracts experienced throughout the twenty-five years were mostly of the tough, opaque, capsule type, like those associated with the rubella epidemic, the textbook lamellar cataract being unusual. Though in Brisbane we did not have the epidemic of cataracts, we did have the epidemics of rubella, with a resulting epidemic of congenital deafness. I was greatly interested lately when examining the eyes of these deaf children (of whom there has been a very large number with a history of maternal rubella in pregnancy) to find that in nearly half of them there was a pronounced pigmentary abnormality of the fundi, and that the other children, without the history of maternal rubella but with the abnormal fundi, were all born in the years 1936, 1937, 1938 and 1941—all but three in 1938 and 1941, the years of the rubella epidemics. Of 60 deaf children born in those two years, 28 had abnormal fundi, while 31 deaf children born in other years between 1930 and 1941 all had normal fundi; only three had cataracts.

LOOKING BACKWARD: A QUARTER-CENTURY OF PÆDIATRICS. III: JUVENILE LEAD POISONING.[1]

By S. F. McDONALD,
Brisbane.

IT is a remarkable experience that in one's medical lifetime a grave disease has disappeared, and disappeared for no certain reason. Yet this is the case with lead poisoning in children in this city.

Twenty-five years ago it was a commonplace for a child to be brought to the hospital with a history of increasing vague ill health—headaches, languor, severe abdominal pain and latterly increasing weakness, at first in the lower limbs, later perhaps in all four. The abdominal pain was remarkable in that it was eased by pressure and was accompanied by constipation—the "dry belly ache" of John Hunter. Examination revealed a depressed, miserable, possibly stunted child, who walked with a peculiar gait, shown on examination to be due to foot-drop, whose hands might also be dropped at the wrist, though the hand could be raised if the fist was clenched (Gowers's sign). Sometimes even the trunk muscles were affected. Further investigation revealed a blue line on the gums opposite septic (not healthy) teeth, a varying degree of albuminuria and hypochromic anæmia with a constant degree of basophilic stippling. Further tests, if they could be performed, revealed lead present in the urine in abnormal quantities; for example, here is a typical laboratory finding:

Laboratory Findings of Plumbism.
12/4/45.

R.B.C.: 3,110,000.
W.B.C.: 6,900.
Hb. 58% (8·2 g.), C.I. 0·9%, N. 68%, L. 30%, E. 2%.
P.B.: 66,000 per million.
Few noroblasts. Platelets normal.
Urine (24 hours): 0·6 mgm. per litre (0·05 mgm. is maximum normal).
Tank and well water: lead-free.
Paint on walls and veranda 71% lead.

Often, too, the disease was familial, as more than one child was affected.

A criticism often put forward was that in chronic lead poisoning foot-drop was rare as opposed to wrist-drop; but years ago Gowers pointed out that in degenerative nervous disease the most actively used muscles tended to be most affected, and Oliver applied this in lead poisoning; thus the painter, the type-setter and the potter developed wrist-drop. On the other hand, American observers who had noticed the disease in children pointed out that the feet were more affected than the hands. The paralysis was entirely motor and gave the full electrical reaction of degeneration.

This was the clinical picture which no one, not even some of our southern colleagues who denied the very existence of the disease, having once seen, could diagnose as anything but lead poisoning; but there were variants which were equally disastrous. These were the "ocular form" and the minor or undeveloped form. The former we know now to be a real encephalopathy, of which the outstanding sign was the result of rising cerebral pressure with increase of spinal fluid and paralysis of the external rectus muscle of one side or another; this produced an obvious internal strabismus, and, still more important, an increasing papilloedema. Here there might be symptoms suggestive of mild meningitis, and, looking back, I am not sure that some of the patients we saw may not have been suffering from lymphocytic meningitis or encephalitis; but there were others who gave a history of no more than indefinite ill health—headache, possibly convulsive seizures, internal strabismus and papilloedema, all relieved by repeated lumbar punctures. Convulsive seizures were not uncommon, and they were promptly relieved by lumbar puncture.

The cerebro-spinal fluid in our experience was clear or at most contained a few lymphocytes. If the child was treated promptly and rescued from further possibility of lead absorption, complete recovery was the rule. On the other hand, sometimes the dog returned to his vomit—more lead absorption took place and the condition recurred up to two or three times; some cases, unfortunately, ended in optic atrophy and complete blindness.

Dr. J. Lockhart Gibson's account of this condition gave rise to great criticism in the south; but his work was later startlingly confirmed by the occurrence of cases of plumbic encephalopathy among Japanese nurslings. Here the source of the lead was a body toilet powder containing a high proportion of lead oxide liberally used by the nursing mother.

The other form, the minor or incompletely developed form, was exceedingly deceptive. The child or children showed no definite symptoms until one looked closely. They were pale, depressed and languid, lacking in appetite, subject to irregular headaches and abdominal pain, with hollow eyes, muddy complexion, and stunted bodies if the condition had been present for some time. Closer examination revealed a blue line in septic gums, an unsatisfactory blood picture with basophilia, and albuminuria of varying degree. The disease, though a frank paralysis never appeared, could be just as deadly as in the other form. One patient I was able to follow for several years until her death, when Dr. E. H. Derrick recovered lead from her bones.

Again, such a condition was not difficult to diagnose when it was suspected; but sometimes not all the signs were present, and diagnosis was faulty both ways. I have seen a rather chronic form of the common leucopenic leuchæmia of childhood diagnosed as lead poisoning; I have experienced the chagrin of hearing that a child whom I had treated with potassium iodide and magnesium sulphate for many months had become a different child when another practitioner gave her a sufficient dose of thyreoid. Similarly I have treated a child suffering from cerebral tumour as if suffering from cerebral plumbism, by repeated lumbar puncture, with of course a temporary improvement, but a final and fatal relapse.

As to the prevalence of the disease, it is difficult to be certain. The late Dr. J. L. Selwood, who had a great deal of experience, put it as high as 40%. In 1927, of a hundred children examined haphazard at the Hospital for Sick Children, 10% showed basophilic stippling of a degree sufficient to suggest lead poisoning; but a follow-up examination of these patients ten years later revealed that very few suffered permanent ill effects. At a clinical meeting in 1922 it was possible to produce 25 children suffering from frank manifestations of lead poisoning. Table I shows how the situation has changed, until today a case of lead poisoning is a clinical curiosity.

TABLE I.
Cases of Lead Poisoning Since 1923 in Queensland Hospitals.

Year.	Brisbane.	Ipswich.
1923	39	2
1924	41	3
1925	44	3
1926	27	2
1927	17	0
1928	17	?2
1929	25	0
1930	17	0
1931	6	?1
1932	8	0
1933	4	0

The paralytic form was recognized to be a form of lead poisoning by the staff of the Hospital for Sick Children, and they published an account in 1892 at the Intercolonial Medical Congress. The work was further pursued by two of them, the late John Lockhart Gibson and Dr. A. Jefferis Turner, whom we still have with us. By a piece of brilliant clinical research, which has never received the recognition it deserved, these two showed that the disease was identical with industrial plumbism, and turned to find a source.

[1] Part of a symposium held at a meeting of the Queensland Branch of the British Medical Association on July 5, 1946.

Lead in tank water from roof nails, lead from taps, lead from chocolates, all were suspected. All failed, until one day a mother made a remark to Gibson as illuminating as that of the dairy-maid to Jenner: "The only ones affected are those that bite their nails." Gibson and Turner, like Jenner, followed the clue; it led them to the white-painted veranda rails. Here the paint in the Queensland climate powdered to a soft dust, coming away on small fingers to be transfegred to small mouths. Later American work showed that paint chewed from cots by "crib-biters" was an important source of lead poisoning elsewhere.

In 1892 Gibson described the cerebral form as basal meningitis, and did not recognize it as a manifestation of lead poisoning until 1897. (He believed it was due to rapid absorption against a slower adsorption in the paralytic form.)

May I describe two cases which were rather unusual but all the more convincing?

Lily N., aged sixteen years, was a cripple, and lived in the upper flat of a house on Gregory Terrace, with white painted lattice. She had little occupation but wandering up and down the veranda, supporting herself by clasping the lattice and biting her nails to the quick. I was called to her early one morning to find her in the throes of severe abdominal pain, which made me think of an abdominal crisis, but which was not typical. Her nails, her teeth and the veranda solved the problem; some years later she was said to be well.

Jimmy H., aged six years, lived in one of the few houses which I knew were not painted with lead paint, and he did not bite his nails nor suck his fingers. But he developed all the signs of a minor lead intoxication—"dry belly-ache", pallor, hypochromic anæmia and lead in the urine. It was found that he spent his Sunday afternoons holding a white picket fence at a relative's house, watching traffic on the road. At afternoon tea he transferred a regular small dose of lead to his mouth with his food. His hands were washed before tea thereafter, and I heard of him last as "air crew".

There is no space to tell of Gibson's fight for lead-free paint and his efforts to teach the evils of nail-biting; but the strange thing remains that, without his being successful in either effort, the disease has disappeared. But its history remains—the history of a brilliant piece of research of a type which it is nowadays the fashion to label somewhat slightingly as merely "clinical". Let those who decry such methods remember that Reid and Lazear worked out the transmission of yellow fever, and Mackenzie the dangers of cardiac irregularity by such means; thus, too, had there been anyone to grasp it, the transmission of malaria could equally well have been worked out in the 1860's, when Samuel Baker noticed that his party on the upper Nile developed malaria only after losing their mosquito nets.[1]

LOOKING BACKWARD: A QUARTER-CENTURY OF PÆDIATRICS. IV: ACUTE OSTEOMYELITIS.[2]

By FELIX ARDEN,
Brisbane.

BEING yet unable to draw upon a full quarter-century of clinical experience, I must begin this story with a paper written twenty-five years ago by Alex Mitchell, at that time surgeon to the Royal Aberdeen Hospital for Sick Children. Stating that "one could not work in a children's hospital without being struck by the fact that there is always going on a certain waste of valuable human life", Mitchell leaves us in no doubt as to the serious disease that osteomyelitis then was. To quote:

> The fact that the local disturbance may be accompanied or preceded by a severe septicæmia means that the initial mortality must always be fairly high until we can find some more prompt and efficient means of serum therapy than we are at present equipped with.

In 1921 the usual textbook teaching as to the treatment in the ordinary case of acute osteomyelitis was that a good-sized piece of bone should be chiselled out to provide for drainage of infected material. More bone could be resected later if necessary. Even the whole shaft might have to be taken out, but if this was contemplated it was advised to wait two months to give time for new periosteal bone to form. Mitchell, however, preferred to resect subperiosteally at the first operation the whole thickness of the shaft, going as far along the bone as the periosteum appeared to be lifted or easily stripped. After the bone was removed the periosteal bed was cleaned with hydrogen peroxide or eusol and packed with gauze strips. Secondary suture was performed in three or four days and Carrell-Dakin treatment was commenced, the limb being immobilized and extended on a Thomas splint. Mitchell had found the transfusion of blood from persons previously vaccinated with staphylococci to be of some value; but it was obviously a method which could be used only occasionally. Vaccines and sera seemed to be of doubtful efficacy.

The second chapter of this story concerns the year 1928. Acute osteomyelitis was still a dread affliction, an editorial in the *British Medical Journal* describing it as "a dangerous and crippling disease" and adding: "Those who suffer from it, if they survive, too often do so only after long suffering and prolonged suppuration, with its attendant risks." But new concepts of the pathology and treatment of osteomyelitis were coming forward. Starr, of Toronto, rejected the prevalent view that infection in the cancellous bone spread deeply into the medulla. Instead, it appeared that the medulla was infected from the subperiosteal space through the Haversian canals. Harry Platt, of Manchester, supported this view, and on these grounds he condemned the "gutter operation" in favour of drilling to locate the infective focus in the bone and a trephine hole for drainage.

Platt rightly pointed out that treatment by early extensive removal of bone was attended by the difficulty of deciding how much bone was devascularized beyond hope, for not all devascularized bone was eventually extruded, some portions which seemed dead being in the end revitalized. Other speakers at the meeting—Platt's paper was read before the Orthopædic Section of the Royal Society of Medicine—condemned diaphysectomy. The tide was turning against such drastic surgery. Most, however, were pessimistic about the value of blood transfusion or intravenous medication or other methods of attempted attack on the general condition.

The scene now shifts to the United States of America. In 1929 Dr. H. Winnett Orr, of Nebraska, published a book entitled "Osteomyelitis and Compound Fractures and Other Infected Wounds". Shortly stated, his principles were: immediate adequate drainage at whatever stage the osteomyelitis was encountered, maintenance at rest of inflamed parts by the application of a plaster cast, wide open drainage by means of a sterile "Vaseline" pack, primary asepsis or antisepsis, the use of irritating antiseptics in the wound being avoided, and post-operative care, emphasis being laid on rest without antiseptic dressings. By "antiseptic dressings", italicized by the author, was meant change of dressings as in the daily toilet of a wound. Dr. Orr recognized that septic bones and soft parts could not be made aseptic by the external application of chemicals, and had discovered from his own experience what all of us know today, that air-borne bacterial contamination and the introduction of mixed infection into the wound were certain unless the most meticulous precautions were taken at the time of dressing. A reviewer of the book described the new practice as "somewhat startling", and commented on the smell which would be generated by the pus-soaked plaster casts. However, Winnett Orr's methods gained the day, with the modification that the dressings were changed occasionally when the ward sister raised her voice in protest. Every child without exception must have preferred the aroma of his plaster cast to the excruciating pain of the daily dressings from which he had been spared.

Two years later, in 1931, the July number of *The Journal of Bone and Joint Surgery* carried a posthumous article by Dr. William S. Baer, of the Johns Hopkins Hospital.

[1] I do not think the term "Gowers's sign" is in the books, but I heard it from both J. L. Gibson and A. J. Turner, as well as from J. Rose Bradford who knew Gowers well.

[2] Part of a symposium held at a meeting of the Queensland Branch of the British Medical Association on July 5, 1946.

under the arresting title of "The Treatment of Chronic Osteomyelitis with the Maggot (Larvæ) of the Blowfly". Since the days of Ambroise Paré, and very likely before then, observations have been recorded of the healthiness of wounds infected with maggots. Dr. Baer's attention had been drawn to the subject by his experience of infected wounds in France during the Great War. Back in Baltimore he found that, while naturally grown larvæ were unsafe because of transmitted microorganisms or spores, the eggs of the common blue and green bottle-flies could be cultivated and sterile larvæ obtained. Dr. Baer's paper contained reports of 89 patients so treated. He concluded that maggots were "a tremendously useful adjunct to the thorough surgical treatment of chronic osteomyelitis and far more successful in securing permanent healing of these extensive wounds than any other method tried". It was found that by their digestive action maggots cleared away minute fragments of bone and soft-tissue sloughs, and by making the wound alkaline reduced the growth of pathogenic bacteria.

Although surgeons must have abhorred fœtid discharges and crawling maggots in wounds as much in 1931 as they would today, these attempts to find new and shorter methods of curing osteomyelitis indicate that they were not satisfied with the contemporary measures. In England surgical opinion was gradually veering away from the radical operations practised earlier. Thus C. P. G. Wakeley, of King's College, addressing the Centenary Meeting of the British Medical Association in 1932, although holding that in every case immediate drainage was required and that no time should be lost in establishing it, said that he generally contented himself with trephining the diaphysis, performing "gutter operations" only on those bones in which the medulla was involved. The principle of immediate drainage in every case, whether pus was present or not, was on a par with the somewhat earlier practice of making free incisions into areas of cellulitis and free cruciate incisions into carbuncles, "so as to give exit to serous and irritating discharges". Wakeley laid more stress than most writers on the non-operative aspects of treatment, advocating immobilization in plaster or a skeleton splint, not only for restricting the spread of infection but for lessening pain. To quote his words: "Constitutional treatment, which is all important in these cases, cannot do any good if the little patient is in constant pain." He said of intravenous antiseptics, such as mercurochrome, that "they do not seem to have any influence on the disease", and "Maggots, although used with success in America, do not seem to have many advocates in this country".

Two years later, in 1934, John Fraser, of Edinburgh, confessed that he also was disappointed with the results of the gutter operation. Any attempt at diaphysectomy he regarded as utterly wrong in principle. His operation (of multiple drill holes starting above the epiphyseal plate and extending along the shaft until healthy marrow was reached, followed by a loose pack of paraffin and flavine gauze, copious dressings and the application of a plaster splint) became the standard procedure and remains so with most surgeons today. Fraser's scheme of removing the first plaster cast in two weeks, then repacking and replastering the wound embodied the good points of the Orr method while obviating its more noxious features.

The increasing emphasis laid by successive writers on general treatment should be noticed. Fraser found that an ordinary blood transfusion was of virtually no value in correcting the general sepsis, although in late cases, in which anæmia existed, it might be of value. Antistaphylococcal serum seemed useless. He relied "upon such principles as an abundant supply of fluid, a high vitamin intake in the form of orange juice, and the use of immunotransfusion in a certain number of cases".

Do not forget the seriousness of acute osteomyelitis even such a short time ago. Fraser's own figures quoted in the same paper were 13 deaths in a series of 56 cases observed over the previous twelve years—a mortality rate of 23·2%. Other surgeons had comparable figures. Deaths were due to pyæmia with secondary abscesses in the lungs, brain *et cetera*. Small wonder that Alex Mitchell, writing again on osteomyelitis in 1938, stated that we could not honestly maintain that our treatment had advanced much in he preceding twenty-five years. He then proceeded to report five patients treated with "Uleron". All were very ill. From the blood of three culture produced a growth of microorganisms and all recovered. Four children underwent operations as well as receiving treatment with "Uleron". The really significant case, to my mind, was that of a boy, aged four years, with involvement of the lower end of the femur. *Staphylococcus aureus* had been isolated from the blood. He was so gravely ill that it was considered that no operative procedure was justified. "Uleron" was given every four hours for three weeks. The temperature fell to normal and the child was discharged from hospital one month after admission, apparently cured.

This paper, which actually marked a turning point, was followed by letters warmly advocating conservative treatment of osteomyelitis. One surgeon was quoted as not having operated on a single patient for the past five years and to have had only one death. Another was able to record 44 cases with only four deaths, by conservative treatment alone. And there were others. However, Mitchell himself, despite the success with "Uleron" just mentioned, seems to have been unconvinced. He wrote in 1939:

> I have never been able to bring myself to abandon operation entirely. What I have had the opportunity of seeing of the non-operative treatment of osteomyelitis has not been encouraging.

Other writers were equally dubious. Eric Lloyd, writing from Great Ormond Street in 1939, although admitting that "extensive guttering operations were things of the past and produced the bad results that were published by himself amongst others in 1928", still had a place for operation. His letter reflects the uncertainty of surgical opinion at the time. He was worried about the treatment in the early acute case and summed up his opinion in an epigram: "Never let the pus out when there isn't any, unless it's bottled up in bone."

You will probably agree that surgical opinion has changed little in the intervening seven years. I remember arguments at clinical meetings here in Brisbane between surgeons who guttered bones, others who were content to drill holes in them, others who declined to operate.

Meanwhile, to combat the associated septicæmia associated with severe cases, immuno-transfusions, antistaphylococcal serum and the intravenous administration of antiseptics had been tried unsuccessfully in turn; d'Herelle's bacteriophage also achieved a fleeting popularity. I remember its being used once in about 1940 at the Brisbane Children's Hospital on a boy, aged seven years, acutely ill with osteomyelitis of the tibia and staphylococcal septicæmia. Despite a drainage operation, his blood continued to yield a growth of organisms, and the outlook seemed hopeless. Intravenous injections of staphylococcal bacteriophage sent his temperature to 107° F. For a few hours death seemed imminent, but he was much improved next day and eventually recovered, but not before a metastatic lesion had developed in the pelvis.

Blood transfusions, mentioned twenty-five years ago only as being disappointing as a cure for septicæmia, gradually became almost a routine measure in treatment. But it is well to remember how recently we have considered it important to maintain the hæmoglobin level at or near normal throughout the illness.

The value of adequate feeding has been an even more recent discovery. At the beginning of the period Calories were the criteria by which diets were judged. A light diet was a standard prescription for the sick. Vitamins were just becoming familiar. It took the rapid methods of plasma protein estimation developed during the second World War really to drive home the importance of giving adequate quantities of protein to the sick.

It was a great day for children when a drug capable of inhibiting the growth of *Staphylococcus aureus in vivo* was discovered. Sulphanilamide and sulphapyridine proved disappointing. "Uleron", already mentioned, had some real successes to its credit; but it was feeble and uncertain

and is now seldom used. It was followed by sulphathiazole and later sulphadiazine and sulphamerazine. All have an undoubted bacteriostatic action and are still employed, but like all the sulphonamide derivatives they are inactive in the presence of pus. This defect greatly restricts their usefulness and makes it unlikely that any patient with acute osteomyelitis, unless treated very early indeed, can be cured by such substances alone.

The last chapter in this brief story of course concerns penicillin. From the moment when it first became available it was used against acute osteomyelitis, both in the form of intramuscular injection and as a local application to the wounds—used, that is to say, as an adjunct to surgery. It is still so used by many; but we have discovered that even penicillin cannot deal with the mixed infection that overtakes the granulating wound. But Florey had prophesied as long ago as 1943 that "one might anticipate the time when osteomyelitis treated early and intensively with penicillin would not require surgical intervention". Surgeons were not long in putting this prophecy to the test. Last year Altmeier and Helmsworth published their results in 34 cases treated with penicillin. They had one death and a greatly reduced incidence of metastatic complications, although the blood of no less than 20 of their patients yielded cultures of microorganisms. Surgical intervention was slight—osteotomy in five cases and incision of the periosteum and drainage in 12. The other 17 patients had no operation whatever and recovered in a matter of weeks.

The first child to be treated by medical means alone was admitted to the Brisbane Children's Hospital in October, 1944. The patient was a boy, aged two years and nine months, suffering from osteomyelitis of the lower end of the femur. He received 1,050,000 units of penicillin over a period of thirteen days, and also 30 grammes of sulphadiazine during the first ten days. We had an anxious time for seventy-two hours at the onset while the local condition seemed to grow worse; but he was discharged from hospital after seventeen days and remained well.

Since October, 1944, every patient with acute osteomyelitis admitted to one of the two surgical units at the Brisbane Children's Hospital has been treated conservatively with penicillin and one of the sulphonamide drugs, usually sulphadiazine. There have been 24 such cases in all. In this small series there have been no deaths and no metastatic infection in other bones from the time of commencement of treatment. In only one case in this series did a sequestrum develop which required removal. Results in the other 23 cases have been excellent. In three subperiosteal abscesses requiring incision developed. One of these patients was the child with the sequestrum; the other two abscesses were sterile when opened. The average length of stay in hospital has been four to five weeks. All patients have been followed in the out-patient department. No recurrences have been seen beyond minor local flares in a few instances, responding to rest. No late sequestrum formation has so far been observed.

A detailed study of these cases is at present being made; but from the few facts given it seems that Florey's prophecy is close to being fulfilled.

And with this one must conclude the story of osteomyelitis during the past quarter-century, a tale not lacking in drama. Consider the changes in treatment spanned by the working lifetime of many a surgeon still in practice. The mortality rate has fallen from 20% practically to nil. Metastatic lesions are almost unknown. The stay in hospital has been reduced from months to a few weeks. In the operating theatre removal of the shaft of the bone, guttering, multiple drill holes, simple incision of the periosteum, each in turn has been practised and discarded. In the wards the screams of children undergoing daily dressings gave place to the stench of pus-soaked plasters, these in turn to wriggling maggots, competing for popularity with mercurochrome, brilliant green and flavine dressings. Now all have gone. Sera, vaccines, immunotransfusions and bacteriophage have been tried and set aside. The pale, emaciated children with discharging wounds are seen no longer. The granulating wounds have gone, and the sequestrectomy operations, and it seems that even secondary anæmia will develop far less often. Today's child with osteomyelitis lies comfortably abed, his limb on a pillow, his only grievance the penicillin nurse with her syringe.

And who can say what the next quarter-century holds?

SEXUAL PROBLEMS OF CHILDHOOD AND ADOLESCENCE.[1]

By H. M. NORTH,
Sydney.

THE fact that the community is made up of two sexes in fairly equal proportions, members of each sex being assigned more or less specific spheres—one sex being regarded as stronger and the other as weaker, one needing to protect and the other needing to be protected—means that relations between the sexes enter into nearly every phase of our lives. I presume that if I raise my hat to a lady in the street, it is a sexual act. When a youth rises and offers his seat to a woman passenger in the train, is that to be regarded as a sexual act? Or is his failure to do so a sexual problem? A person taking my title literally might expect that I would consider the type of education required by members of each sex, how far it might run parallel for the two sexes and how far it would need to be specific, and that would lead on to a consideration of the spheres to be filled later as men and women by the boys and girls of today.

But I do not mean to use the term "sexual" in this way at all, but to adopt the significance given to it in the jargon of teachers and welfare workers—that is, pertaining to the seeking of satisfaction by excitement of the genital organs. For the purposes of this paper I intend to give "sexual" only a morbid significance, and it will not be applied to any healthy relation between the sexes. I shall even include activities carried out in the strictest privacy and isolation, and therefore involving no one else and having nothing to do with the relations of the sexes. This is a loose use of language which may easily lead to loose thinking, as I believe it has done in the hands even of very eminent workers; but I know of no other word in common usage, and I do not suppose that my title has conveyed a misconception to anyone.

Sublimation and Degradation.

You are familiar with Freud's useful concept of sublimation—a process, he conceived, by which the energy of the sexual urge is directed into creative activities in the intellectual, æsthetic or social spheres, and so satisfied. I hold that if this proposition is true, we must also accept as a corollary the converse proposition, that when creative energies, directed to socially acceptable ends, are persistently thwarted and frustrated, they are apt to become degraded into primitive forms of seeking satisfaction. I call this the law of degradation. As a therapeutic tool I find it more useful than the concept of sublimation, because I am continually being consulted about the appearance of primitive forms of seeking satisfaction, but no one ever feels it necessary to ask an opinion about the manifestation of sublimated energies. To put my concept into readily understandable language, I use the analogy of the degradation of physical energy to heat, and say that just as physical energies when obstructed become degraded to heat, so obstruction degrades life's energies to preoccupation with the bodily organs. If you find the thermostat of your motor-car showing "dangerous", you search for an obstruction in your mechanical system; it would be useless to pour water on the engine or pack it in ice. I recommend that, when you are called upon to deal with a sexual problem, you should search for some impediment or

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on July 18, 1946.

obstruction in the patient's life energies. It is no use imposing limitations or using punishments or threats of consequences. You will only find the energy appearing in more and more degraded form.

It is a fundamental law of neurology that newly acquired systems are still plastic in their functions and therefore unstable and easily deranged, while archaic elements are stable and rigid in their mode of action. The primitive urge is much the same in man as in the worm. It is the social implications of the mating impulse which are distinctively human and confer on man a dignity not shared by the beasts. It is not dangerous to suppress the primitive urge, but it is very dangerous to suppress the distinctively human qualities that go with it. In illustration I quote a case, which is perhaps not very unusual.

CASE I.—A man in the early twenties, hollow-eyed and dishevelled, shuffled into my hospital out-patients' room. He opened the interview by informing me that if I could not give him relief he would commit suicide that very afternoon. He went on to say that he had been having intercourse with one or more different women every day, and the more he tried to satisfy himself the more imperious became his desire. He could not sleep and could not eat, nor could he occupy his mind with anything but this one all-pervading topic.

After hearing his story and making a physical examination, I used the analogy of hunger, and told him that if a starving man ate food which was not nourishing, it only made his hunger a hundred times worse. He was like a ship-wrecked mariner cast away at sea, who had long struggled with his thirst, tormented by the lapping of the sea round his life-boat, until he had at last given way and taken a mouthful of salt water. Now his thirst had become more and more uncontrollable, and he must go on drinking until he lost his reason and his life. I went on to tell my patient that he had sadly misconceived his own nature when he supposed that he could satisfy his urge to mate as he had been attempting to do. Since the human infant needed two parents for nearly a score of years, Nature had provided for this by so constituting man that he could satisfy himself only by clinging to one mate for life, cherishing her, protecting her and providing for her and her children.

It was remarkable to see the change a new philosophy worked in this man. Of course, he needed sedatives to combat his exhaustion symptoms; but these would have given only temporary relief if it had not been possible to change his mental attitude. Two weeks later he was bright and happy. He told me that he had found a job and was working hard to establish himself in a position to enable him to take a wife. The mating urge was now harnessed to vocational achievement, and promised to be a valuable driving force.

The point is that we must view life whole. It is fatal to consider sex in isolation, as something apart. All logic-tight compartments of the mind are extremely dangerous. Physiologists are never weary of telling us of the integrative functions of the nervous system, whereby all the elements of our being are brought into one harmony. Yet when they come to write of sex, they often forget to put it into this framework of life as a whole. And psychologists follow them blindly.

When man evolved with an offspring so helpless that it needed many years of care and protection, it would have been strange if Nature had not provided for it by implanting in its parents a corresponding need to cling together and to care for and to bring up their offspring. Otherwise the species would soon have disappeared. A ram may cohabit with a whole flock and go off; he is needed no more; the ewe is quite adequate to rear her young alone. But what has a man achieved, if he beget a hundred offspring and leave them all to perish?

Masturbation in Babies.

From time to time harassed mothers seek advice about masturbation in tiny babies. This is a very perplexing problem. As he is not yet endowed with language, you cannot reason with such an infant. He is too small to punish or to understand punishment. Somehow he manages to evade all the barriers of diapers and binders. So young and yet so dissolute, is he tainted with original sin? In desperation his mother asks, was it for this that she brought him into the world?

Now let us consider the matter from the baby's point of view. Of course, he has to start his education as soon as he is born; and this first year is going to be a very full one for him. One of his first problems is to sort himself out from the rest of the world. He has to distinguish between the "me" and the "not-me", for he has not yet gained familiarity with his own body. It is a veritable new continent to be explored and he has to set out like the geographer noting capes and bays, mountains and rivers. On account of incomplete myelination of the visual and auditory pathways, he will have to rely on touch and kinæsthetic senses, which have sufficiently matured.

When you have toured the country, you will remember that you became bored while traversing a wide stretch of plain; but your interest was at once aroused by the advent of hills, valleys and other accidents of the landscape. So our baby passes over the large flat surfaces of his body very cursorily, but is at once arrested by projections and openings. He is looking for landmarks. His fingers and toes give him delight for weeks at a time, but it is really a red-letter day when he comes to explore his mouth properly. It is so full of features, and in addition his sensitive tongue can explore his thumb more intimately than can be managed with the other hand. On the contrary, when he puts his rattle in his mouth, it receives no sensations as his thumb does. Obviously the rattle belongs in the category of the "not-me".

Now in this process of exploration he must sooner or later come to the genital area. Mostly it is buried under many wrappings, which are assigned to the "not-me", because they are not capable of receiving sensations; but when they are penetrated, another very interesting area of the "me" is reached. Of course, he knows nothing of male and female nor of the many wicked and sordid things known to you and me. But it is natural that he should want to complete his exploration—in fact, his education would have a big gap without it. Let him complete it and he will be ready to go on with the next big step of getting in touch with the outside world.

Masturbation and other Sexual Practices in Pre-Pubertal Children.

The Binet scale postulates that a normal child should be able to say whether he is a little boy or a little girl before he is three years old, and this must imply some curiosity regarding sex differences. One cannot say that any age is immune. Mothers bring children of perhaps six or seven years along to tell about their depraved habits, with all the righteous indigation of the would-be pure in heart. One hears of the mother in and out of the child's bedroom all night, pulling his hands out of the bedclothes. Often the poor youngster struggles for long hours to keep his weary eyes open; but once nature gets the better of him and he sinks into slumber, his hands return fatally to the forbidden area, which has been kept so much before his waking mind. But the mother is soon there in all the triumph of successful detection to drag his hands above the bedclothes again, forgetting that he cannot be held responsible for what he does in his sleep. Other measures are adopted. I recall a little girl who was crucified to her bed each night with an elaborate system of ropes and straps, as well as being manacled by day. The cords had left deep suppurating wounds.

You will say that this mother was not normal, and I always find that it is the mother rather than the child who requires treatment. It is remarkable how much a child reflects the emotional bias of the mother-person who cares for him.

One little girl, a State ward, was referred to me three times in a little over twelve months. At the first visit she had just been relinquished as a monster of sexual iniquity by a guardian whom I never had an opportunity of interviewing. Presently her next guardian complained of her being a liar and a thief; but when questioned about the child's sexual habits had noticed nothing amiss. A third guardian presently sought advice, because the child was so highly strung and nervous. She described her as a dear little girl, so pure in mind and so honest and truthful that she could be trusted with anything.

A mother will at times bring her child to the clinic for advice regarding masturbation without any more

tangible evidence than the presence of black rings under his eyes, arguing that he is so dreamy, listless and tired. Inquiry will usually show that he is not allowed to have any companions, because the neighbours all have such bad children; but he is encouraged to keep late hours and to display himself in adult company. Otherwise he may "sit and draw" or something equally futile, except when he is day-dreaming at the pictures. "He sits and draws" usually means making crude copies without any attempt to study design, colour, light or perspective. In other words, the pencil and paper are also provided as an aid to unhealthy day-dreaming. One must admit that, if he does not masturbate, everything possible has been done to induce him to do so.

From autoerotic practices the next step is to seduce other young children to sexual play. One rarely finds children at this age acting in couples as at a later age; but there may be a small group of both sexes who have managed to evade such unhealthy parental supervision. Or masturbation may lead to other acts, such as interfering with domestic animals.

The first essential in treatment is to modify the emotional attitudes of the complaining parent, because the child must be influenced almost entirely through her. Therefore during history-taking one should lose no opportunity, when she is disposed to talk about herself. After a thorough investigation, including careful physical examination, one must reassure the mother with regard to the child's normality and the absence of any harmful physical effects of the habit. I use the analogy of the machine which has "run hot", and point out that the engineer will achieve nothing by combating the heat directly by measures such as packing the engine in ice; but he must proceed to discover where the mechanism is obstructed. So she will do well not to reprimand or punish her child. Perhaps it is best not even to let him know when he is detected, but to take it as a warning for herself to investigate how his life energies are being obstructed.

What the child requires is sound mental and physical hygiene, with adequate opportunities to deploy his developmental energies constructively and creatively. Means of associating with companions of his own age and sex in suitably directed activities are essential. Projects will be devised to educate his sense of responsibility and self-reliance. The aid of a trained social worker is invaluable here. The five-year-old who worries his mother by tugging at his pants may be put to some task that will occupy his hands and educate his manual dexterity without any reference to forbidden fruit.

It is always a tragedy when, as often happens, a young child is packed off to an orphanage or boarding school for some sexual misdemeanour. Certainly he shows no sexual interest there; but he grows up with the shallowness and unreliability of the institution child, and shows many new problems when he returns home.

Juvenile Offenders

This subject might seem to call for a classification of offences. But I am more interested in offenders than in their offences, and the handling of the case depends far more on the general character and background of the offender than on the nature of his offence. Therefore I shall speak only in general terms of the nature of the offences for which I have offenders referred to me, and then attempt a classification of types of offenders, indicating appropriate handling in each group.

Freud speaks of the polymorph-perverse nature of the impulses of the normal child, and while we may object to the contradiction in terms involved, the conception is valuable. Measured by the standards of the mature individual, the adolescent certainly shows polymorphous perversity. Adolescence is a period of testing and probing. The adolescent must know his potentialities and powers, come to terms with his urges, and strive for a stability which is in conformity with his social needs and yet usefully harnesses all the forces of his nature.

Social sanctions are not imposed from without, but are derived by the long, painful evolutionary process of survival of the fittest to fill the needs of individuals in their relations to one another. Society has evolved only through modification of innate dispositions of the individual, all represented in modification of neural structure. But distinctively human characteristics are more recently acquired and therefore unstable—distinctive characteristics of civilized man more so than those of primitive man. Yet our long prehuman ancestry has left deep traces, which like vestigial organs are sometimes no longer required and often lead to a lot of trouble.

In juveniles one does not observe the fixed perverse practices of later years. Many authorities regard homosexual interests as a phase of normal development (perhaps a provision of nature to obviate reproduction before adequate maturity), and Havelock Ellis[6] considers that a person should not be diagnosed as homosexual before the age of twenty-five years. Should we not regard the adult homosexual as a person who has never grown up, an escapist from life, who, while refusing the responsibilities and sacrifices of parenthood, seeks a substitute gratification? The algolagnist is a still more self-centred individual, who keeps his sexual urges in a logic-tight compartment as things apart. He endeavours to find sexual satisfaction on the animal level. But he experiences no satisfaction. Either he becomes angry and attacks his partner, when he is called a sadist. Or he feels humiliated and guilty at his beastly performance and seeks punishment; then he is a masochist.

The accomplished libertine is rarely arraigned as an offender. It is his victims who are brought before children's courts and referred to child guidance clinics. This is the only type of female sexual offender of whom I have had much experience. Her sexual offence is only incidental to the seeking of hectic pleasures in a self-indulgent mode of life, and serves as payment for a good time.

By and large, the offender is a callow youth whose act has occurred, as it were, explosively under the impulse of an uncontrollable excitement. In such an upheaval it is to be supposed that the urge will appear in a mutilated or fragmentary form. It will show the crudest and most primitive elements. But the form it takes depends less on the constitution of the offender than on the attendant circumstances. If it is not checked, a relative satisfaction may be experienced from such an outburst, which may in time become habitual and crystallize into an adult perversion. Indecent exposure is the commonest offence, but it is not exhibitionism in the accepted sense of the term. It is a blind and crude invitation to cohabitation, which can never succeed. Certainly the youth is proud of his exposed member, and feels that the assailed female will not be able to resist the attraction. Often the exposure may be accompanied by attempts at lascivious handling or interference with clothing. Such grabbing may also occur without any exposure in a secluded street or empty railway carriage. Masturbation and the accompanying fantasies are often factors, in that they excite without satisfying.

For instance, a youth of fourteen years, religiously inclined and carrying a heavy school curriculum creditably, had learned to masturbate five months previously. His initial essays were attended by excessive feelings of disgust and guilt; on each occasion he resorted to fervid prayer for help, vowing never to fall again. During the summer vacation he had insufficient occupation and gave way more freely. He had become more hardened to the practice, so that disgust was no longer sufficient to damp his excitement for a period. He tells that he got his bicycle and rode to a nearby railway station, with the deliberate intention of committing his offence. He posted himself in the subway until a married woman entered, when he exposed himself and attempted to lift her clothes.

Offences against small girls or boys are resorted to by individuals who are too cowardly to approach persons nearer their own age.

Physical Factors in Offenders.

I have records of only one case of frank glandular dystrophy, an "infant hercules" syndrome, and of another case, which I believe had been misdiagnosed as of *dystrophia adiposo-genitalis*. I quote these two cases.

CASE II.—W.G. was referred to me at the age of fifteen and a half years while detained in a reformatory, to which he had been committed at the age of twelve years and eight months for indecent assault on a female, aged four years. Puberty had occurred at the age of five years. His mother had died when he was nine years old, and from that time he had had practically no home supervision. He did not attend school after he attained eleven years, exemption having been obtained on a medical certificate alleging that he was teased by his schoolfellows on account of his abnormality. Records showed that during his residence in the institution W.G. had not come under notice at any time for any form of misconduct, nor had he shown any abnormal interest in sex.

I reported that there was very little evidence that W.G. had at any time been less capable than others of exercising self-control, but that any boy who is left idle and unsupervised over a period of years is necessarily in grave danger. He was placed in suitable employment, where he made good.

CASE III.—P.A., aged thirteen years and three months, was found guilty of indecent assault on a girl, aged seven years, in company with a dull boy, aged twelve years and six months. He was a big fat boy, 65·25 inches in height and weighing 161·5 pounds. During the inquiry into his medical history he remarked that he had started a course of injections twelve months previously, "because I never grew down below since I was a baby". He gave up the treatment against advice after he had received two injections per week for six weeks; this could hardly have brought about the profuse growth of pubic hair then appearing. His genitals were actually well formed for a boy at the onset of puberty, though obscured by rolls of fat. It is significant that his accomplice had already matured and was endowed with very conspicuous genitals.

My impression is that a disproportionately large number of fat boys are brought before the court for offences against little girls. As in Shakespeare's Falstaff, the twin vices of gluttony and lechery are often associated. Though the offender is always referred to the clinic on account of the latter vice, it is more practical and profitable to treat the former. If he can be persuaded to accept the discipline of a moderately rigid diet and vigorous daily exercise, one observes a growing asceticism in the other sphere of sensuality.

Generally, offenders show few physical defects, though conditions such as rheumatic heart disease and asthma are sometimes factors, in that they enable the subjects to lead idle, pampered lives. It is important that medical attendants should see that in addition to the discipline of the medical *régime*, such children are taught to be responsible and self-controlled within the limitations of their maladies. Since they may be fitted only for sedentary vocations, every advantage should be taken of schooling facilities.

Morosis (Congenital Mental Deficiency).

In the case of the moron, the treatment of choice is prophylaxis, and often it is difficult to provide without the aid of a mental defectives' colony, even though the best of will is shown by the relatives. The moron is genetically unsuited for parenthood, and vocationally he can never make an adequate *paterfamilias* or housewife. Therefore one cannot hold out to him any prospect of domestic felicity. He is the creature of habit, and once he commences to offend, he is likely to repeat the offence. The only safeguard is to deprive him of his liberty. Probably his is the one class of human beings who are capable of achieving satisfaction on the animal level of sexual behaviour. Like his subhuman ancestors, he is largely the creature of the impulse of the moment, with little thought for the future and little capacity for profiting by experience except through the influence of ingrained habit; whereas it is one of the most distinctive of human characteristics to integrate the past and present with future prospects so as to make one harmonious whole of life. Therefore it is desirable that the moron be recognized at as early an age as possible, and that he be provided with an education similar to that allotted the "gammas" in Huxley's "Brave New World"; that he be conditioned from the first to fear and distrust the opposite sex, all sexual interest being ruthlessly repressed. He must find his satisfaction in performing routine tasks as "hewer of wood and drawer of water", and it has been repeatedly shown that the moron can lead a happy and contented life if suitably trained and placed in employment of this nature. The keynote of his education should be the inculcation of regular and industrious habits, with close attention to routine and thoroughness in small things. When his education has broken down and he has shown himself a social menace, his relatives must be prepared to part with him. With adequate initial outlay in trained staff and equipment, it should not be beyond the capacity of scientific research and wise administration to make him self-supporting within the confines of an institution.

Other Mental Disorders.

The lack of control of maniacal disturbance, the bizarre, constrained behaviour of schizophrenia and the automatism of epilepsy, need to be considered in classifying sexual offenders. The treatment is the accepted treatment of these disorders. The same applies to alcoholism and drug addiction.

The Antisocial Group (Mixed Group of Doshay).

Doshay[3] has performed a notable service in clearly differentiating from the primary sexual offender, the antisocial individual whose sexual offences are merely incidents in his war on society. To the antisocial group belong persons who, in addition to the sexual offence in question, have engaged in a series of other offences, such as ungovernableness, truancy, abscondings, stealing and burglary. In Doshay's research such persons are shown to have indulged in adult life in many offences of a violent nature, but in relatively few and minor sexual offences.

The patient we are considering is a person whose upbringing, or lack of it, has not fitted him to adjust himself to social living, but he is ready to prey on society. He seeks a life of self-indulgence and pleasure. He may give a long list of jobs he has tried for a week or two with increasing intervals of unemployment; or perhaps he has always refused to accept any employment. It should not be beyond psychiatric insight to make a diagnosis even in the absence of any previous court record. The treatment is the treatment of the basic maladjustment, rather than that of the individual sexual offence.

The Primary Group.

Finally we come to persons whose outstanding psychiatric problem is the sexual offence. They come from all ranks of society and are of all grades of endowment—dull, average and superior intelligence—but include rather a higher proportion of persons of superior intelligence than the antisocial group. Their school records are consistently better than those of members of the antisocial group. Some are good students or prominent in apprenticeship courses. Many come from good homes, the other members of which are highly respected and valuable members of the community. Some are prominent in church affiliation and have constructed lofty ideals, which unfortunately do not take into consideration all the forces of their nature. Often it is almost a case of Dr. Jekyll and Mr. Hyde, the subject feeling that he has done something quite foreign to himself; but I have never observed any indication of amnesia. Others verge towards the frontiers of the antisocial group, from which there is no sharp line of demarcation. If the patient has changed his employment several times, reasons given seem to have fair validity; or he may have left several jobs, but seems to be settling down now. A poor employment record may be due to the foolish insistence of his relatives on an unsuitable vocation. Many subjects show neurotic traits, and there is usually evidence of some stunting of the personality in one direction or another.

Out-patient treatment is almost universally successful, while deprivation of liberty is often an unmitigated tragedy. To interrupt a promising apprenticeship or to

cut short a budding career may have life-long consequences, in that it is impossible ever to pick up the threads again. The offence arises out of a social malady, and cannot be cured by barring the patient from society for two or three very important years. Following the law of degradation of energy enunciated above, the frustrated drives often find further expression in sexual acts and preoccupation with the body, so that the patient becomes a major problem in the institution. If one or both parents are non-cooperative or hopelessly prejudiced, neurotic or psychopathic, it may be necessary to arrange a foster-home, and the court's authority can usually be invoked to make it a condition of probation; but this is rarely necessary. Parents have been rudely shaken out of their complacency. The arrest and police inquiries, the writing of the formal statement for the police, the grief of relations and the gloom which settles on the household, the court procedures and the clinic treatment are sufficient to arouse "strong latent forces of shame and guilt inherent in the moral cultural pattern"[3] and to prepare the subject to integrate his impulses harmoniously.

It is a favourable moment for psychotherapeutic intervention, especially as the subject is apt to feel that the clinic stands between him and the rigors of the law. He is not ordered to make further attendances, but it is explained to him that the court does not wish to punish him, but has the duty of protecting the public as well as himself from any repetition of his offence. Therefore it would be helpful if he would arrange to come back for advice from time to time, so that the court would know that he was under treatment.

Treatment is aimed at producing an integrated and harmonious personality. The services of a trained social worker are invaluable in adjusting the environment. The patient is much in need of a philosophy of life, and the psychiatrist usually commences with a talk on the lines of the introductory part of this address. The matter is presented didactically, reliance being placed on medical authority, as one might discuss sugar metabolism with a diabetic. Comments and discussion by the youth are invited. As he has usually had many homilies before he comes to the psychiatrist from the points of view of the police officer, the parent, the churchman, the lawyer, the welfare worker *et cetera*, it is well to comment at a moment, when he is suitably moved: "Of course I'm only a doctor and I can't go into the moral side of it. No doubt you will hear that elsewhere." This conveys to him that he is being told only what is necessary for his own physical and mental well-being, and harnesses powerful ego-tendencies on the side of self-control. At subsequent interviews one usually inquires regarding his health, sleep and dreams, social and recreational activities, vocational progress and so on, rarely hinting at his sexual life. But he has full opportunity of receiving help, if he is struggling with masturbation or is disturbed by erotic dreams. In his daily life the knowledge of the next clinic appointment has a strong steadying effect.

Doshay[4] makes the following statement:

> It is probable that adult sex criminals of violent type stem not from court- and clinic-treated cases, but rather from juvenile sex offenders who failed to obtain the benefits of such treatment, as in instances where juvenile sex offenders remain undetected, where parents hush known sex events through fear of family embarrassment, or where treatment is rendered haphazardly and ineffectively.

Prophylaxis.

My views on prophylaxis have been largely indicated in the foregoing discussion, and space will permit only one or two comments here. Again and again I have heard a parent irritably open the interview more or less in these words: "Doctor, I cannot understand how this has happened. He knew all the facts of life." Therefore it has occurred to me that it is desirable to point to the risk that the protagonists of sexual education may in their enthusiasm unwittingly convey to parents, that the sexual manual is all that is necessary, forgetting to stress that education in self-control is the first essential and knowledge the adjuvant and prop. It is obviously absurd to expect a youth habituated to self-indulgence in most other avenues to exercise self-restraint where sex is concerned.

It is a distinctive character of *Homo sapiens*, in contrast to the rest of the animal kingdom, that he is capable of exercising self-control and postponing immediate gratification for the sake of greater satisfaction in the future. The cultivation of this character is indispensable to all human happiness and more than anything else confers on man the title to regard himself as lord of creation.

Sexual prophylaxis certainly begins in the cradle and is the concern of the baby clinic. From the very beginning the baby must learn to enjoy his parents' cherishing and affection without wanting to be taken up all the time. From such small beginnings self-control needs to be educated step by step all through the developmental period. The small boy who has learned to pass by the tuck-shop in order to save his penny for a more worthy cause in the future is already less likely to be carried away by a sudden sexual impulse during his adolescence.

References.

(1) Havelock Ellis: "Psychology of Sex", 1933, page 204.
(2) L. J. Doshay: "The Boy Sex Offender and his Later Career", 1943, *passim*.
(3) L. J. Doshay: *Loco citato*, page 169.
(4) L. J. Doshay: *Loco citato*, page 172.

THE SEX LIFE OF THE ADOLESCENT.[1]

By IRENE SEBIRE, M.B., B.S., D.P.M.,
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ADOLESCENCE is a phase of development rather than a period of time in the continuing life of the individual, and needs to be considered not only in relation to physiological changes, but interpreted in terms of its social values. Chronological age does not provide a valid criterion for physical maturation. Neither is it a satisfactory guide to the degree of social maturity achieved, and to the capacity of the adolescent to deal with complications presented in his widening social experiences.

Thus adolescence cannot be considered as an isolated circumstance, nor his sex life as distinct from the adolescent's total functioning. Although maturation in the adolescent is basically a biological process, it occurs at a period when he is involved in emotional and intellectual adjustments to social demands. Sex is not a problem specific to adolescence, but with puberty it acquires a new and social significance, coincidental with the entrance of the individual into the larger life of the race.

Earlier Adjustments.

Throughout life the child has been learning to accommodate his instinctive desires to prevailing standards of conventional behaviour. In pre-adolescent years he has, in general, found no great difficulty in adjusting himself to the requirements of his group. His attitudes, desires and emotions tend to keep pace with opportunities for expressing his needs. His patterns of behaviour have been fairly well established at the end of the first decade, and on the whole he has not been subjected to confusing experiences. But with the awakening and intensification of sexual urges, he finds himself aware of restrictions and ethical standards which are nowhere more demanding than in the area of sexual expression. Concentration upon, and possibly morbid preoccupation with, specific sex feelings differentiate the attitude of the adolescent from that of the younger child. The more normally his adolescence proceeds, the less conscious is he of the task of adjusting himself to those cultural influences which conflict with his personal wishes and urgencies. His response to immediate social requirements is dictated largely by the quality of his

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on July 18, 1946.

earlier training and his previous experiences in adaptation. The real test comes in his association with companions of similar age.

Group Influences.

The adolescent's movement from the supporting influence of the family and the protecting atmosphere of the home, introduces him more intimately to a similar age group. The conduct of its adolescent members is motivated by factors largely in keeping with his own. He desires their approval as a measure of his prestige and recognition of his improved status. The compelling need for identification with his companions may necessitate the repudiation of firmly established modes of conduct, any resultant conflict being alleviated by the sharing of the responsibility with his associates. While still lacking the capacity to function independently on a mature level, he may accept or reject their collective behaviour in terms of parental standards.

If the urge for independent action is imperative, he tends to regard irregular behaviour as symbolic of freedom from parental restraint. Particularly is this true of the girl sex delinquent, who, rebelling against adult authority, accepts the standard of moral behaviour typical of her group. The social development of boys and girls does not depend upon their age. While boys are still bound together in sex-restricted groups, girls of similar age are already showing marked concern for the opposite sex. Romantic interests lead the adolescent girl into situations where attention and flattery from older youths provide risks which she has not the experience to handle. With such girls sexual relationships are often merely coincidental to a round of gaiety and pleasure, and are accepted with a minimum of self-reproach because "other girls do it". In such circumstances the adolescent girl is not obliged to endure the penalty of ostracism by her particular social group. This absolves her further from the need to respect conventions imposed by the older generation.

The average adolescent, however, attempts to reconcile his new bodily sensations with his social obligations. With his physical maturity comes the knowledge of his capacity and need for sexual relationships, for the satisfaction of which our moral codes permit no approved means outside marriage. He is confused further by varying attitudes towards morality in the community generally.

Changing Moral Codes.

Probably no aspect of human behaviour shows more bewildering conflicts in social usages and moral standards than sex. On the one hand there is actual or nominal adherence to traditional sanctions, with limitation of frank discussion; on the other, there is over-stimulation of interest in sex matters and their importance as a frequent topic of conversation. Neither of these attitudes is indicative necessarily of the incidence of sexual freedom or so called "immorality". But the present era of sex liberalism, more permissive and less restrictive, indicates an increased public toleration and an easing of taboos.

Widespread discussion of sex in books and magazines, the popularization of Freudian theory, the radical views of supporters of the "new morality", the over-emphasized erotic appeal of many motion picture films, all suggest a modification of the conventional acceptances of a former generation. There is a general and healthy repudiation of the old subterfuges of traditional morality, of the alleged necessity for safeguarding monogamy by prostitution, of the difference in standards of moral behaviour required of men and of women.

Increasing effectiveness of and the spread of information on contraceptive methods, and the improved medical attack on venereal diseases, have facilitated the claim to the right of sex experimentation. The present prevalence of sexual experiences between young men and women points to an acceptance of premarital relationships, especially with postponement of marriage until the parties are economically independent.

War conditions, in accelerating the passing of prudery, appear to have swung the pendulum rather far in the opposite direction. This, however, may be a passing phase. One cannot assume that conditions will continue to change in the same direction, nor that such a change will ultimately reverse its direction. It seems certain, however, that this generation has seen a pronounced change in attitudes towards sexual behaviour; but it remains to be seen to what extent these new attitudes will be woven into our cultural pattern. There is room for optimism perhaps in the fact that a subject once obscured by mystery and false sentimentality is being discussed on the plane of a normal and healthy function.

Adolescent Attitudes.

In the midst of this confusion of changing observances, the adolescent is required to orientate himself and to develop a reliable code of sexual behaviour. Whereas his bodily development is an inevitable process, his attitudes are highly sensitive to external influences and lag behind his physical and intellectual development.

Sex realization, and the need for heterosexual adjustment, occur at a time when he may find himself in social situations for which he is unprepared in attitude. Personal inhibitions and environmental rigidity may create emotional disturbances. He is driven to develop a variety of defensive reactions designed to help him cope with augmented impulses. Relief may come from substitute expression in the form of masturbation, imaginery gratification, erotic dreams, preoccupation with sex matters, or perverted forms of sexual behaviour. If he believes that sex is "sinful", he may become excessively idealistic or may temporize by the formation of compulsive habits. The realities of menstruation, masturbation and seminal emissions may be repugnant in contrast to an idealized object of sexual phantasy. An over-emphasized interest in philosophical concepts, religion or abstract considerations, or even the keeping of a diary of imaginary sexual experiences, may form another type of defence. He may feel the need of and indulge in masturbation, and then have feelings of unworthiness due to sex interests, practices or fears. On the other hand, he may express his sexual impulses freely in the form of delinquent behaviour.

Dewey makes the following statement:

> The evil of checking impulses is not that they are checked, but the absence of redirection into more discriminated and comprehensive activities. The evil resides in a refusal of direct attention which forces the impulse into disguise or concealment.

A successful outcome of the adolescent's striving is one in which he is driven neither to complete repudiation nor to delinquent behaviour, but to an experience which represents a realistic compromise. His problem lies in making successful heterosexual adjustment in keeping with approved moral codes, and in achieving a personal standard of conduct which permits gratification in socially acceptable forms. He is unlikely to solve this problem adequately, or to build up a reliable degree of self-control, unless he is assured of appropriate sex education.

Sex Education.

Whether or not a special problem of sex education exists at adolescence, depends upon the nature of the subject's previous education and social experiences. Ideally his education and accompanying behaviour should merge almost imperceptibly from one period of development into another. Before reaching adolescence, he requires to be reasonably well informed of the normal functioning of bodily systems including the generative organs, much in the same fashion as he is instructed in other important matters.

Sex education in its broader sense, will not be limited to the so-called "facts of life". It should include more than information dealing solely with the evils of masturbation, the risks of venereal disease and the danger of an unwanted pregnancy. The emotional and social implications of sex life are of greater importance than even information on the physiology of sex and reproduction. So conceived, sex education is an inseparable part of the child's total education in general behaviour, and applies similarly to the cultivation of attitudes and habits.

Most parents, unfortunately, are ill-equipped to impart sex information and education to their children. Their

and is now seldom used. It was followed by sulphathiazole and later sulphadiazine and sulphamerazine. All have an undoubted bacteriostatic action and are still employed, but like all the sulphonamide derivatives they are inactive in the presence of pus. This defect greatly restricts their usefulness and makes it unlikely that any patient with acute osteomyelitis, unless treated very early indeed, can be cured by such substances alone.

The last chapter in this brief story of course concerns penicillin. From the moment when it first became available it was used against acute osteomyelitis, both in the form of intramuscular injection and as a local application to the wounds—used, that is to say, as an adjunct to surgery. It is still so used by many; but we have discovered that even penicillin cannot deal with the mixed infection that overtakes the granulating wound. But Florey had prophesied as long ago as 1943 that "one might anticipate the time when osteomyelitis treated early and intensively with penicillin would not require surgical intervention". Surgeons were not long in putting this prophecy to the test. Last year Altmeier and Helmsworth published their results in 34 cases treated with penicillin. They had one death and a greatly reduced incidence of metastatic complications, although the blood of no less than 20 of their patients yielded cultures of microorganisms. Surgical intervention was slight—osteotomy in five cases and incision of the periosteum and drainage in 12. The other 17 patients had no operation whatever and recovered in a matter of weeks.

The first child to be treated by medical means alone was admitted to the Brisbane Children's Hospital in October, 1944. The patient was a boy, aged two years and nine months, suffering from osteomyelitis of the lower end of the femur. He received 1,050,000 units of penicillin over a period of thirteen days, and also 30 grammes of sulphadiazine during the first ten days. We had an anxious time for seventy-two hours at the onset while the local condition seemed to grow worse; but he was discharged from hospital after seventeen days and remained well.

Since October, 1944, every patient with acute osteomyelitis admitted to one of the two surgical units at the Brisbane Children's Hospital has been treated conservatively with penicillin and one of the sulphonamide drugs, usually sulphadiazine. There have been 24 such cases in all. In this small series there have been no deaths and no metastatic infection in other bones from the time of commencement of treatment. In only one case in this series did a sequestrum develop which required removal. Results in the other 23 cases have been excellent. In three subperiosteal abscesses requiring incision developed. One of these patients was the child with the sequestrum; the other two abscesses were sterile when opened. The average length of stay in hospital has been four to five weeks. All patients have been followed in the out-patient department. No recurrences have been seen beyond minor local flares in a few instances, responding to rest. No late sequestrum formation has so far been observed.

A detailed study of these cases is at present being made; but from the few facts given it seems that Florey's prophecy is close to being fulfilled.

And with this one must conclude the story of osteomyelitis during the past quarter-century, a tale not lacking in drama. Consider the changes in treatment spanned by the working lifetime of many a surgeon still in practice. The mortality rate has fallen from 20% practically to nil. Metastatic lesions are almost unknown. The stay in hospital has been reduced from months to a few weeks. In the operating theatre removal of the shaft of the bone, guttering, multiple drill holes, simple incision of the periosteum, each in turn has been practised and discarded. In the wards the screams of children undergoing daily dressings gave place to the stench of pus-soaked plasters, these in turn to wriggling maggots, competing for popularity with mercurochrome, brilliant green and flavine dressings. Now all have gone. Sera, vaccines, immunotransfusions and bacteriophage have been tried and set aside. The pale, emaciated children with discharging wounds are seen no longer. The granulating wounds have gone, and the sequestrectomy operations, and it seems that even secondary anæmia will develop far less often. Today's child with osteomyelitis lies comfortably abed, his limb on a pillow, his only grievance the penicillin nurse with her syringe.

And who can say what the next quarter-century holds?

SEXUAL PROBLEMS OF CHILDHOOD AND ADOLESCENCE.[1]

By H. M. NORTH,
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THE fact that the community is made up of two sexes in fairly equal proportions, members of each sex being assigned more or less specific spheres—one sex being regarded as stronger and the other as weaker, one needing to protect and the other needing to be protected—means that relations between the sexes enter into nearly every phase of our lives. I presume that if I raise my hat to a lady in the street, it is a sexual act. When a youth rises and offers his seat to a woman passenger in the train, is that to be regarded as a sexual act? Or is his failure to do so a sexual problem?. A person taking my title literally might expect that I would consider the type of education required by members of each sex, how far it might run parallel for the two sexes and how far it would need to be specific, and that would lead on to a consideration of the spheres to be filled later as men and women by the boys and girls of today.

But I do not mean to use the term "sexual" in this way at all, but to adopt the significance given to it in the jargon of teachers and welfare workers—that is, pertaining to the seeking of satisfaction by excitement of the genital organs. For the purposes of this paper I intend to give "sexual" only a morbid significance, and it will not be applied to any healthy relation between the sexes. I shall even include activities carried out in the strictest privacy and isolation, and therefore involving no one else and having nothing to do with the relations of the sexes. This is a loose use of language which may easily lead to loose thinking, as I believe it has done in the hands even of very eminent workers; but I know of no other word in common usage, and I do not suppose that my title has conveyed a misconception to anyone.

Sublimation and Degradation.

You are familiar with Freud's useful concept of sublimation—a process, he conceived, by which the energy of the sexual urge is directed into creative activities in the intellectual, æsthetic or social spheres, and so satisfied. I hold that if this proposition is true, we must also accept as a corollary the converse proposition, that when creative energies, directed to socially acceptable ends, are persistently thwarted and frustrated, they are apt to become degraded into primitive forms of seeking satisfaction. I call this the law of degradation. As a therapeutic tool I find it more useful than the concept of sublimation, because I am continually being consulted about the appearance of primitive forms of seeking satisfaction, but no one ever feels it necessary to ask an opinion about the manifestation of sublimated energies. To put my concept into readily understandable language, I use the analogy of the degradation of physical energy to heat, and say that just as physical energies when obstructed become degraded to heat, so obstruction degrades life's energies to preoccupation with the bodily organs. If you find the thermostat of your motor-car showing "dangerous", you search for an obstruction in your mechanical system; it would be useless to pour water on the engine or pack it in ice. I recommend that, when you are called upon to deal with a sexual problem, you should search for some impediment or

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on July 18, 1946.

obstruction in the patient's life energies. It is no use imposing limitations or using punishments or threats of consequences. You will only find the energy appearing in more and more degraded form.

It is a fundamental law of neurology that newly acquired systems are still plastic in their functions and therefore unstable and easily deranged, while archaic elements are stable and rigid in their mode of action. The primitive urge is much the same in man as in the worm. It is the social implications of the mating impulse which are distinctively human and confer on man a dignity not shared by the beasts. It is not dangerous to suppress the primitive urge, but it is very dangerous to suppress the distinctively human qualities that go with it. In illustration I quote a case, which is perhaps not very unusual.

CASE I.—A man in the early twenties, hollow-eyed and dishevelled, shuffled into my hospital out-patients' room. He opened the interview by informing me that if I could not give him relief he would commit suicide that very afternoon. He went on to say that he had been having intercourse with one or more different women every day, and the more he tried to satisfy himself the more imperious became his desire. He could not sleep and could not eat, nor could he occupy his mind with anything but this one all-pervading topic.

After hearing his story and making a physical examination, I used the analogy of hunger, and told him that if a starving man ate food which was not nourishing, it only made his hunger a hundred times worse. He was like a ship-wrecked mariner cast away at sea, who had long struggled with his thirst, tormented by the lapping of the sea round his life-boat, until he had at last given way and taken a mouthful of salt water. Now his thirst had become more and more uncontrollable, and he must go on drinking until he lost his reason and his life. I went on to tell my patient that he had sadly misconceived his own nature when he supposed that he could satisfy his urge to mate as he had been attempting to do. Since the human infant needed two parents for nearly a score of years, Nature had provided for this by so constituting man that he could satisfy himself only by clinging to one mate for life, cherishing her, protecting her and providing for her and her children.

It was remarkable to see the change a new philosophy worked in this man. Of course, he needed sedatives to combat his exhaustion symptoms; but these would have given only temporary relief if it had not been possible to change his mental attitude. Two weeks later he was bright and happy. He told me that he had found a job and was working hard to establish himself in a position to enable him to take a wife. The mating urge was now harnessed to vocational achievement, and promised to be a valuable driving force.

The point is that we must view life whole. It is fatal to consider sex in isolation, as something apart. All logic-tight compartments of the mind are extremely dangerous. Physiologists are never weary of telling us of the integrative functions of the nervous system, whereby all the elements of our being are brought into one harmony. Yet when they come to write of sex, they often forget to put it into this framework of life as a whole. And psychologists follow them blindly.

When man evolved with an offspring so helpless that it needed many years of care and protection, it would have been strange if Nature had not provided for it by implanting in its parents a corresponding need to cling together and to care for and to bring up their offspring. Otherwise the species would soon have disappeared. A ram may cohabit with a whole flock and go off; he is needed no more; the ewe is quite adequate to rear her young alone. But what has a man achieved, if he beget a hundred offspring and leave them all to perish?

Masturbation in Babies.

From time to time harassed mothers seek advice about masturbation in tiny babies. This is a very perplexing problem. As he is not yet endowed with language, you cannot reason with such an infant. He is too small to punish or to understand punishment. Somehow he manages to evade all the barriers of diapers and binders. So young and yet so dissolute, is he tainted with original sin? In desperation his mother asks, was it for this that she brought him into the world?

Now let us consider the matter from the baby's point of view. Of course, he has to start his education as soon as he is born; and this first year is going to be a very full one for him. One of his first problems is to sort himself out from the rest of the world. He has to distinguish between the "me" and the "not-me", for he has not yet gained familiarity with his own body. It is a veritable new continent to be explored and he has to set out like the geographer noting capes and bays, mountains and rivers. On account of incomplete myelination of the visual and auditory pathways, he will have to rely on touch and kinæsthetic senses, which have sufficiently matured.

When you have toured the country, you will remember that you became bored while traversing a wide stretch of plain; but your interest was at once aroused by the advent of hills, valleys and other accidents of the landscape. So our baby passes over the large flat surfaces of his body very cursorily, but is at once arrested by projections and openings. He is looking for landmarks. His fingers and toes give him delight for weeks at a time, but it is really a red-letter day when he comes to explore his mouth properly. It is so full of features, and in addition his sensitive tongue can explore his thumb more intimately than can be managed with the other hand. On the contrary, when he puts his rattle in his mouth, it receives no sensations as his thumb does. Obviously the rattle belongs in the category of the "not-me".

Now in this process of exploration he must sooner or later come to the genital area. Mostly it is buried under many wrappings, which are assigned to the "not-me", because they are not capable of receiving sensations; but when they are penetrated, another very interesting area of the "me" is reached. Of course, he knows nothing of male and female nor of the many wicked and sordid things known to you and me. But it is natural that he should want to complete his exploration—in fact, his education would have a big gap without it. Let him complete it and he will be ready to go on with the next big step of getting in touch with the outside world.

Masturbation and other Sexual Practices in Pre-Pubertal Children.

The Binet scale postulates that a normal child should be able to say whether he is a little boy or a little girl before he is three years old, and this must imply some curiosity regarding sex differences. One cannot say that any age is immune. Mothers bring children of perhaps six or seven years along to tell about their depraved habits, with all the righteous indigation of the would-be pure in heart. One hears of the mother in and out of the child's bedroom all night, pulling his hands out of the bed-clothes. Often the poor youngster struggles for long hours to keep his weary eyes open; but once nature gets the better of him and he sinks into slumber, his hands return fatally to the forbidden area, which has been kept so much before his waking mind. But the mother is soon there in all the triumph of successful detection to drag his hands above the bedclothes again, forgetting that he cannot be held responsible for what he does in his sleep. Other measures are adopted. I recall a little girl who was crucified to her bed each night with an elaborate system of ropes and straps, as well as being manacled by day. The cords had left deep suppurating wounds.

You will say that this mother was not normal, and I always find that it is the mother rather than the child who requires treatment. It is remarkable how much a child reflects the emotional bias of the mother-person who cares for him.

One little girl, a State ward, was referred to me three times in a little over twelve months. At the first visit she had just been relinquished as a monster of sexual iniquity by a guardian whom I never had an opportunity of interviewing. Presently her next guardian complained of her being a liar and a thief; but when questioned about the child's sexual habits had noticed nothing amiss. A third guardian presently sought advice, because the child was so highly strung and nervous. She described her as a dear little girl, so pure in mind and so honest and truthful that she could be trusted with anything.

A mother will at times bring her child to the clinic for advice regarding masturbation without any more

tangible evidence than the presence of black rings under his eyes, arguing that he is so dreamy, listless and tired. Inquiry will usually show that he is not allowed to have any companions, because the neighbours all have such bad children; but he is encouraged to keep late hours and to display himself in adult company. Otherwise he may "sit and draw" or something equally futile, except when he is day-dreaming at the pictures. "He sits and draws" usually means making crude copies without any attempt to study design, colour, light or perspective. In other words, the pencil and paper are also provided as an aid to unhealthy day-dreaming. One must admit that, if he does not masturbate, everything possible has been done to induce him to do so.

From autoerotic practices the next step is to seduce other young children to sexual play. One rarely finds children at this age acting in couples as at a later age; but there may be a small group of both sexes who have managed to evade such unhealthy parental supervision. Or masturbation may lead to other acts, such as interfering with domestic animals.

The first essential in treatment is to modify the emotional attitudes of the complaining parent, because the child must be influenced almost entirely through her. Therefore during history-taking one should lose no opportunity, when she is disposed to talk about herself. After a thorough investigation, including careful physical examination, one must reassure the mother with regard to the child's normality and the absence of any harmful physical effects of the habit. I use the analogy of the machine which has "run hot", and point out that the engineer will achieve nothing by combating the heat directly by measures such as packing the engine in ice; but he must proceed to discover where the mechanism is obstructed. So she will do well not to reprimand or punish her child. Perhaps it is best not even to let him know when he is detected, but to take it as a warning for herself to investigate how his life energies are being obstructed.

What the child requires is sound mental and physical hygiene, with adequate opportunities to deploy his developmental energies constructively and creatively. Means of associating with companions of his own age and sex in suitably directed activities are essential. Projects will be devised to educate his sense of responsibility and self-reliance. The aid of a trained social worker is invaluable here. The five-year-old who worries his mother by tugging at his pants may be put to some task that will occupy his hands and educate his manual dexterity without any reference to forbidden fruit.

It is always a tragedy when, as often happens, a young child is packed off to an orphanage or boarding school for some sexual misdemeanour. Certainly he shows no sexual interest there; but he grows up with the shallowness and unreliability of the institution child, and shows many new problems when he returns home.

Juvenile Offenders

This subject might seem to call for a classification of offences. But I am more interested in offenders than in their offences, and the handling of the case depends far more on the general character and background of the offender than on the nature of his offence. Therefore I shall speak only in general terms of the nature of the offences for which I have offenders referred to me, and then attempt a classification of types of offenders, indicating appropriate handling in each group.

Freud speaks of the polymorph-perverse nature of the impulses of the normal child, and while we may object to the contradiction in terms involved, the conception is valuable. Measured by the standards of the mature individual, the adolescent certainly shows polymorphous perversity. Adolescence is a period of testing and probing. The adolescent must know his potentialities and powers, come to terms with his urges, and strive for a stability which is in conformity with his social needs and yet usefully harnesses all the forces of his nature.

Social sanctions are not imposed from without, but are derived by the long, painful evolutionary process of survival of the fittest to fill the needs of individuals in their relations to one another. Society has evolved only through modification of innate dispositions of the individual, all represented in modification of neural structure. But distinctively human characteristics are more recently acquired and therefore unstable—distinctive characteristics of civilized man more so than those of primitive man. Yet our long prehuman ancestry has left deep traces, which like vestigial organs are sometimes no longer required and often lead to a lot of trouble.

In juveniles one does not observe the fixed perverse practices of later years. Many authorities regard homosexual interests as a phase of normal development (perhaps a provision of nature to obviate reproduction before adequate maturity), and Havelock Ellis[1] considers that a person should not be diagnosed as homosexual before the age of twenty-five years. Should we not regard the adult homosexual as a person who has never grown up, an escapist from life, who, while refusing the responsibilities and sacrifices of parenthood, seeks a substitute gratification? The algolagnist is a still more self-centred individual, who keeps his sexual urges in a logic-tight compartment as things apart. He endeavours to find sexual satisfaction on the animal level. But he experiences no satisfaction. Either he becomes angry and attacks his partner, when he is called a sadist. Or he feels humiliated and guilty at his beastly performance and seeks punishment; then he is a masochist.

The accomplished libertine is rarely arraigned as an offender. It is his victims who are brought before children's courts and referred to child guidance clinics. This is the only type of female sexual offender of whom I have had much experience. Her sexual offence is only incidental to the seeking of hectic pleasures in a self-indulgent mode of life, and serves as payment for a good time.

By and large, the offender is a callow youth whose act has occurred, as it were, explosively under the impulse of an uncontrollable excitement. In such an upheaval it is to be supposed that the urge will appear in a mutilated or fragmentary form. It will show the crudest and most primitive elements. But the form it takes depends less on the constitution of the offender than on the attendant circumstances. If it is not checked, a relative satisfaction may be experienced from such an outburst, which may in time become habitual and crystallize into an adult perversion. Indecent exposure is the commonest offence, but it is not exhibitionism in the accepted sense of the term. It is a blind and crude invitation to cohabitation, which can never succeed. Certainly the youth is proud of his exposed member, and feels that the assailed female will not be able to resist the attraction. Often the exposure may be accompanied by attempts at lascivious handling or interference with clothing. Such grabbing may also occur without any exposure in a secluded street or empty railway carriage. Masturbation and the accompanying fantasies are often factors, in that they excite without satisfying.

For instance, a youth of fourteen years, religiously inclined and carrying a heavy school curriculum creditably, had learned to masturbate five months previously. His initial essays were attended by excessive feelings of disgust and guilt; on each occasion he resorted to fervid prayer for help, vowing never to fall again. During the summer vacation he had insufficient occupation and gave way more freely. He had become more hardened to the practice, so that disgust was no longer sufficient to damp his excitement for a period. He tells that he got his bicycle and rode to a nearby railway station, with the deliberate intention of committing his offence. He posted himself in the subway until a married woman entered, when he exposed himself and attempted to lift her clothes.

Offences against small girls or boys are resorted to by individuals who are too cowardly to approach persons nearer their own age.

Physical Factors in Offenders.

I have records of only one case of frank glandular dystrophy, an "infant hercules" syndrome, and of another case, which I believe had been misdiagnosed as of *dystrophia adiposo-genitalis*. I quote these two cases.

CASE II.—W.G. was referred to me at the age of fifteen and a half years while detained in a reformatory, to which he had been committed at the age of twelve years and eight months for indecent assault on a female, aged four years. Puberty had occurred at the age of five years. His mother had died when he was nine years old, and from that time he had had practically no home supervision. He did not attend school after he attained eleven years, exemption having been obtained on a medical certificate alleging that he was teased by his schoolfellows on account of his abnormality. Records showed that during his residence in the institution W.G. had not come under notice at any time for any form of misconduct, nor had he shown any abnormal interest in sex.

I reported that there was very little evidence that W.G. had at any time been less capable than others of exercising self-control, but that any boy who is left idle and unsupervised over a period of years is necessarily in grave danger. He was placed in suitable employment, where he made good.

CASE III.—P.A., aged thirteen years and three months, was found guilty of indecent assault on a girl, aged seven years, in company with a dull boy, aged twelve years and six months. He was a big fat boy, 65·25 inches in height and weighing 161·5 pounds. During the inquiry into his medical history he remarked that he had started a course of injections twelve months previously, "because I never grew down below since I was a baby". He gave up the treatment against advice after he had received two injections per week for six weeks; this could hardly have brought about the profuse growth of pubic hair then appearing. His genitals were actually well formed for a boy at the onset of puberty, though obscured by rolls of fat. It is significant that his accomplice had already matured and was endowed with very conspicuous genitals.

My impression is that a disproportionately large number of fat boys are brought before the court for offences against little girls. As in Shakespeare's Falstaff, the twin vices of gluttony and lechery are often associated. Though the offender is always referred to the clinic on account of the latter vice, it is more practical and profitable to treat the former. If he can be persuaded to accept the discipline of a moderately rigid diet and vigorous daily exercise, one observes a growing asceticism in the other sphere of sensuality.

Generally, offenders show few physical defects, though conditions such as rheumatic heart disease and asthma are sometimes factors, in that they enable the subjects to lead idle, pampered lives. It is important that medical attendants should see that in addition to the discipline of the medical *régime*, such children are taught to be responsible and self-controlled within the limitations of their maladies. Since they may be fitted only for sedentary vocations, every advantage should be taken of schooling facilities.

Morosis (Congenital Mental Deficiency).

In the case of the moron, the treatment of choice is prophylaxis, and often it is difficult to provide without the aid of a mental defectives' colony, even though the best of will is shown by the relatives. The moron is genetically unsuited for parenthood, and vocationally he can never make an adequate *paterfamilias* or housewife. Therefore one cannot hold out to him any prospect of domestic felicity. He is the creature of habit, and once he commences to offend, he is likely to repeat the offence. The only safeguard is to deprive him of his liberty. Probably his is the one class of human beings who are capable of achieving satisfaction on the animal level of sexual behaviour. Like his subhuman ancestors, he is largely the creature of the impulse of the moment, with little thought for the future and little capacity for profiting by experience except through the influence of ingrained habit; whereas it is one of the most distinctive of human characteristics to integrate the past and present with future prospects so as to make one harmonious whole of life. Therefore it is desirable that the moron be recognized at as early an age as possible, and that he be provided with an education similar to that allotted the "gammas" in Huxley's "Brave New World"; that he be conditioned from the first to fear and distrust the opposite sex, all sexual interest being ruthlessly repressed. He must find his satisfaction in performing routine tasks as "hewer of wood and drawer of water", and it has been repeatedly shown that the moron can lead a happy and contented life if suitably trained and placed in employment of this nature. The keynote of his education should be the inculcation of regular and industrious habits, with close attention to routine and thoroughness in small things. When his education has broken down and he has shown himself a social menace, his relatives must be prepared to part with him. With adequate initial outlay in trained staff and equipment, it should not be beyond the capacity of scientific research and wise administration to make him self-supporting within the confines of an institution.

Other Mental Disorders.

The lack of control of maniacal disturbance, the bizarre, constrained behaviour of schizophrenia and the automatism of epilepsy, need to be considered in classifying sexual offenders. The treatment is the accepted treatment of these disorders. The same applies to alcoholism and drug addiction.

The Antisocial Group (Mixed Group of Doshay).

Doshay[12] has performed a notable service in clearly differentiating from the primary sexual offender, the antisocial individual whose sexual offences are merely incidents in his war on society. To the antisocial group belong persons who, in addition to the sexual offence in question, have engaged in a series of other offences, such as ungovernableness, truancy, abscondings, stealing and burglary. In Doshay's research such persons are shown to have indulged in adult life in many offences of a violent nature, but in relatively few and minor sexual offences.

The patient we are considering is a person whose upbringing, or lack of it, has not fitted him to adjust himself to social living, but he is ready to prey on society. He seeks a life of self-indulgence and pleasure. He may give a long list of jobs he has tried for a week or two with increasing intervals of unemployment; or perhaps he has always refused to accept any employment. It should not be beyond psychiatric insight to make a diagnosis even in the absence of any previous court record. The treatment is the treatment of the basic maladjustment, rather than that of the individual sexual offence.

The Primary Group.

Finally we come to persons whose outstanding psychiatric problem is the sexual offence. They come from all ranks of society and are of all grades of endowment—dull, average and superior intelligence—but include rather a higher proportion of persons of superior intelligence than the antisocial group. Their school records are consistently better than those of members of the antisocial group. Some are good students or prominent in apprenticeship courses. Many come from good homes, the other members of which are highly respected and valuable members of the community. Some are prominent in church affiliation and have constructed lofty ideals, which unfortunately do not take into consideration all the forces of their nature. Often it is almost a case of Dr. Jekyll and Mr. Hyde, the subject feeling that he has done something quite foreign to himself; but I have never observed any indication of amnesia. Others verge towards the frontiers of the antisocial group, from which there is no sharp line of demarcation. If the patient has changed his employment several times, reasons given seem to have fair validity; or he may have left several jobs, but seems to be settling down now. A poor employment record may be due to the foolish insistence of his relatives on an unsuitable vocation. Many subjects show neurotic traits, and there is usually evidence of some stunting of the personality in one direction or another.

Out-patient treatment is almost universally successful, while deprivation of liberty is often an unmitigated tragedy. To interrupt a promising apprenticeship or to

cut short a budding career may have life-long consequences, in that it is impossible ever to pick up the threads again. The offence arises out of a social malady, and cannot be cured by barring the patient from society for two or three very important years. Following the law of degradation of energy enunciated above, the frustrated drives often find further expression in sexual acts and preoccupation with the body, so that the patient becomes a major problem in the institution. If one or both parents are non-cooperative or hopelessly prejudiced, neurotic or psychopathic, it may be necessary to arrange a foster-home, and the court's authority can usually be invoked to make it a condition of probation; but this is rarely necessary. Parents have been rudely shaken out of their complacency. The arrest and police inquiries, the writing of the formal statement for the police, the grief of relations and the gloom which settles on the household, the court procedures and the clinic treatment are sufficient to arouse "strong latent forces of shame and guilt inherent in the moral cultural pattern"[2] and to prepare the subject to integrate his impulses harmoniously.

It is a favourable moment for psychotherapeutic intervention, especially as the subject is apt to feel that the clinic stands between him and the rigors of the law. He is not ordered to make further attendances, but it is explained to him that the court does not wish to punish him, but has the duty of protecting the public as well as himself from any repetition of his offence. Therefore it would be helpful if he would arrange to come back for advice from time to time, so that the court would know that he was under treatment.

Treatment is aimed at producing an integrated and harmonious personality. The services of a trained social worker are invaluable in adjusting the environment. The patient is much in need of a philosophy of life, and the psychiatrist usually commences with a talk on the lines of the introductory part of this address. The matter is presented didactically, reliance being placed on medical authority, as one might discuss sugar metabolism with a diabetic. Comments and discussion by the youth are invited. As he has usually had many homilies before he comes to the psychiatrist from the points of view of the police officer, the parent, the churchman, the lawyer, the welfare worker *et cetera*, it is well to comment at a moment, when he is suitably moved: "Of course I'm only a doctor and I can't go into the moral side of it. No doubt you will hear that elsewhere." This conveys to him that he is being told only what is necessary for his own physical and mental well-being, and harnesses powerful ego-tendencies on the side of self-control. At subsequent interviews one usually inquires regarding his health, sleep and dreams, social and recreational activities, vocational progress and so on, rarely hinting at his sexual life. But he has full opportunity of receiving help, if he is struggling with masturbation or is disturbed by erotic dreams. In his daily life the knowledge of the next clinic appointment has a strong steadying effect.

Doshay[3] makes the following statement:

> It is probable that adult sex criminals of violent type stem not from court- and clinic-treated cases, but rather from juvenile sex offenders who failed to obtain the benefits of such treatment, as in instances where juvenile sex offenders remain undetected, where parents hush known sex events through fear of family embarrassment, or where treatment is rendered haphazardly and ineffectively.

Prophylaxis.

My views on prophylaxis have been largely indicated in the foregoing discussion, and space will permit only one or two comments here. Again and again I have heard a parent irritably open the interview more or less in these words: "Doctor, I cannot understand how this has happened. He knew all the facts of life." Therefore it has occurred to me that it is desirable to point to the risk that the protagonists of sexual education may in their enthusiasm unwittingly convey to parents, that the sexual manual is all that is necessary, forgetting to stress that education in self-control is the first essential and knowledge the adjuvant and prop. It is obviously absurd to expect a youth habituated to self-indulgence in most other avenues to exercise self-restraint where sex is concerned.

It is a distinctive character of *Homo sapiens*, in contrast to the rest of the animal kingdom, that he is capable of exercising self-control and postponing immediate gratification for the sake of greater satisfaction in the future. The cultivation of this character is indispensable to all human happiness and more than anything else confers on man the title to regard himself as lord of creation.

Sexual prophylaxis certainly begins in the cradle and is the concern of the baby clinic. From the very beginning the baby must learn to enjoy his parents' cherishing and affection without wanting to be taken up all the time. From such small beginnings self-control needs to be educated step by step all through the developmental period. The small boy who has learned to pass by the tuck-shop in order to save his penny for a more worthy cause in the future is already less likely to be carried away by a sudden sexual impulse during his adolescence.

References.

(1) Havelock Ellis: "Psychology of Sex", 1933, page 204.
(2) L. J. Doshay: "The Boy Sex Offender and his Later Career", 1943, *passim*.
(3) L. J. Doshay: *Loco citato*, page 169.
(4) L. J. Doshay: *Loco citato*, page 172.

THE SEX LIFE OF THE ADOLESCENT.[1]

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ADOLESCENCE is a phase of development rather than a period of time in the continuing life of the individual, and needs to be considered not only in relation to physiological changes, but interpreted in terms of its social values. Chronological age does not provide a valid criterion for physical maturation. Neither is it a satisfactory guide to the degree of social maturity achieved, and to the capacity of the adolescent to deal with complications presented in his widening social experiences.

Thus adolescence cannot be considered as an isolated circumstance, nor his sex life as distinct from the adolescent's total functioning. Although maturation in the adolescent is basically a biological process, it occurs at a period when he is involved in emotional and intellectual adjustments to social demands. Sex is not a problem specific to adolescence, but with puberty it acquires a new and social significance, coincidental with the entrance of the individual into the larger life of the race.

Earlier Adjustments.

Throughout life the child has been learning to accommodate his instinctive desires to prevailing standards of conventional behaviour. In pre-adolescent years he has, in general, found no great difficulty in adjusting himself to the requirements of his group. His attitudes, desires and emotions tend to keep pace with opportunities for expressing his needs. His patterns of behaviour have been fairly well established at the end of the first decade, and on the whole he has not been subjected to confusing experiences. But with the awakening and intensification of sexual urges, he finds himself aware of restrictions and ethical standards which are nowhere more demanding than in the area of sexual expression. Concentration upon, and possibly morbid preoccupation with, specific sex feelings differentiate the attitude of the adolescent from that of the younger child. The more normally his adolescence proceeds, the less conscious is he of the task of adjusting himself to those cultural influences which conflict with his personal wishes and urgencies. His response to immediate social requirements is dictated largely by the quality of his

[1] Read at a meeting of the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association on July 18, 1946.

earlier training and his previous experiences in adaptation. The real test comes in his association with companions of similar age.

Group Influences.

The adolescent's movement from the supporting influence of the family and the protecting atmosphere of the home, introduces him more intimately to a similar age group. The conduct of its adolescent members is motivated by factors largely in keeping with his own. He desires their approval as a measure of his prestige and recognition of his improved status. The compelling need for identification with his companions may necessitate the repudiation of firmly established modes of conduct, any resultant conflict being alleviated by the sharing of the responsibility with his associates. While still lacking the capacity to function independently on a mature level, he may accept or reject their collective behaviour in terms of parental standards.

If the urge for independent action is imperative, he tends to regard irregular behaviour as symbolic of freedom from parental restraint. Particularly is this true of the girl sex delinquent, who, rebelling against adult authority, accepts the standard of moral behaviour typical of her group. The social development of boys and girls does not depend upon their age. While boys are still bound together in sex-restricted groups, girls of similar age are already showing marked concern for the opposite sex. Romantic interests lead the adolescent girl into situations where attention and flattery from older youths provide risks which she has not the experience to handle. With such girls sexual relationships are often merely coincidental to a round of gaiety and pleasure, and are accepted with a minimum of self-reproach because "other girls do it". In such circumstances the adolescent girl is not obliged to endure the penalty of ostracism by her particular social group. This absolves her further from the need to respect conventions imposed by the older generation.

The average adolescent, however, attempts to reconcile his new bodily sensations with his social obligations. With his physical maturity comes the knowledge of his capacity and need for sexual relationships, for the satisfaction of which our moral codes permit no approved means outside marriage. He is confused further by varying attitudes towards morality in the community generally.

Changing Moral Codes.

Probably no aspect of human behaviour shows more bewildering conflicts in social usages and moral standards than sex. On the one hand there is actual or nominal adherence to traditional sanctions, with limitation of frank discussion; on the other, there is over-stimulation of interest in sex matters and their importance as a frequent topic of conversation. Neither of these attitudes is indicative necessarily of the incidence of sexual freedom or so called "immorality". But the present era of sex liberalism, more permissive and less restrictive, indicates an increased public toleration and an easing of taboos.

Widespread discussion of sex in books and magazines, the popularization of Freudian theory, the radical views of supporters of the "new morality", the over-emphasized erotic appeal of many motion picture films, all suggest a modification of the conventional acceptances of a former generation. There is a general and healthy repudiation of the old subterfuges of traditional morality, of the alleged necessity for safeguarding monogamy by prostitution, of the difference in standards of moral behaviour required of men and of women.

Increasing effectiveness of and the spread of information on contraceptive methods, and the improved medical attack on venereal diseases, have facilitated the claim to the right of sex experimentation. The present prevalence of sexual experiences between young men and women points to an acceptance of premarital relationships, especially with postponement of marriage until the parties are economically independent.

War conditions, in accelerating the passing of prudery, appear to have swung the pendulum rather far in the opposite direction. This, however, may be a passing phase. One cannot assume that conditions will continue to change in the same direction, nor that such a change will ultimately reverse its direction. It seems certain, however, that this generation has seen a pronounced change in attitudes towards sexual behaviour; but it remains to be seen to what extent these new attitudes will be woven into our cultural pattern. There is room for optimism perhaps in the fact that a subject once obscured by mystery and false sentimentality is being discussed on the plane of a normal and healthy function.

Adolescent Attitudes.

In the midst of this confusion of changing observances, the adolescent is required to orientate himself and to develop a reliable code of sexual behaviour. Whereas his bodily development is an inevitable process, his attitudes are highly sensitive to external influences and lag behind his physical and intellectual development.

Sex realization, and the need for heterosexual adjustment, occur at a time when he may find himself in social situations for which he is unprepared in attitude. Personal inhibitions and environmental rigidity may create emotional disturbances. He is driven to develop a variety of defensive reactions designed to help him cope with augmented impulses. Relief may come from substitute expression in the form of masturbation, imaginery gratification, erotic dreams, preoccupation with sex matters, or perverted forms of sexual behaviour. If he believes that sex is "sinful", he may become excessively idealistic or may temporize by the formation of compulsive habits. The realities of menstruation, masturbation and seminal emissions may be repugnant in contrast to an idealized object of sexual phantasy. An over-emphasized interest in philosophical concepts, religion or abstract considerations, or even the keeping of a diary of imaginary sexual experiences, may form another type of defence. He may feel the need of and indulge in masturbation, and then have feelings of unworthiness due to sex interests, practices or fears. On the other hand, he may express his sexual impulses freely in the form of delinquent behaviour.

Dewey makes the following statement:

> The evil of checking impulses is not that they are checked, but the absence of redirection into more discriminated and comprehensive activities. The evil resides in a refusal of direct attention which forces the impulse into disguise or concealment.

A successful outcome of the adolescent's striving is one in which he is driven neither to complete repudiation nor to delinquent behaviour, but to an experience which represents a realistic compromise. His problem lies in making successful heterosexual adjustment in keeping with approved moral codes, and in achieving a personal standard of conduct which permits gratification in socially acceptable forms. He is unlikely to solve this problem adequately, or to build up a reliable degree of self-control, unless he is assured of appropriate sex education.

Sex Education.

Whether or not a special problem of sex education exists at adolescence, depends upon the nature of the subject's previous education and social experiences. Ideally his education and accompanying behaviour should merge almost imperceptibly from one period of development into another. Before reaching adolescence, he requires to be reasonably well informed of the normal functioning of bodily systems including the generative organs, much in the same fashion as he is instructed in other important matters.

Sex education in its broader sense, will not be limited to the so-called "facts of life". It should include more than information dealing solely with the evils of masturbation, the risks of venereal disease and the danger of an unwanted pregnancy. The emotional and social implications of sex life are of greater importance than even information on the physiology of sex and reproduction. So conceived, sex education is an inseparable part of the child's total education in general behaviour, and applies similarly to the cultivation of attitudes and habits.

Most parents, unfortunately, are ill-equipped to impart sex information and education to their children. Their

embarrassment, as much as their ignorance, precludes an approach to the subject free from ambiguity, false sentimentality, distortion and false emphasis. They have difficulty in dispelling the uncertainty or the resistance to knowledge which is fairly typical of their adolescent sons and daughters. The majority of parents need help and advice in developing an appropriate attitude themselves towards sex matters, before they can interpret the sexual function convincingly, and impart the necessary knowledge. It is often not until symptoms of morbid anxiety arise that the parent feels obliged to seek expert advice. Simple as the problem may have been at the outset, the situation is frequently obscure and complicated by the time it reaches the psychiatrist.

Reviews.

ANIMAL BREEDING.

MEDICAL MEN practising in country districts throughout Australia are inevitably brought into more or less intimate contact with the daily work on adjacent stations and farms. Many take a considerable interest in the breeding of cattle, sheep, horses, pigs, sheep-dogs and poultry in their neighbourhood. Some are station-owners or have farms of their own. One of the best equipped model dairies in Australia belongs to and is managed by a busy specialist in a capital city. To all these and to other members of our profession interested in genetics, Dr. R. B. Kelley's "Principles and Methods of Animal Breeding" will appeal as an interesting and in many cases a practically useful book.[1]

Dr. Kelley is the officer-in-charge of the McMaster Field Station in New South Wales. Called upon to deliver a refresher course on animal breeding to veterinary graduates and officers of the Agricultural Department, he prepared a concise account of the principles involved in the breeding of livestock as a basis for his lectures. The volume before us, which he rightly deemed would be of service to breeders, is the result.

The book begins with an historical background, the earlier chapters giving an account of the foundation work of famous early British breeders of cattle, sheep and horses, with pedigrees. This is followed by a short account of the cell and its chromosome mechanism, followed by a chapter dealing concisely with Mendelism and describing sex-linkage. Breeders might note the following sentence: "Broadly, if animals beget progeny which in particular respects are unlike the parents, it is an odds-on chance that the characters then disclosed are recessive conditions." In Chapter IX, polygenic or multiple-factor characters are discussed and the normal curve of distribution and its application to breeding purposes are described with the meaning of the term standard deviation. Then follows an analysis of phenotypic selection in breeding, based on the appearance of the animal, and necessarily that followed empirically by the early breeders. Genotypic selection, based upon the inherited genes and estimated by the performances of the progeny, is next considered in detail, with the advantages and disadvantages of "isolation" of groups large and small, of in-breeding and of line breeding. Examples of the processes involved are given, and the breeding methods for mice and maize and occasional analogies from further afield help the inexperienced reader better to grasp the principles involved.

Chapter XII is on modern animal breeding, and the next chapter discusses animal breeding in Australia. Dr. Kelley notes that "early Australian wool was grown on virgin country, relatively free from disease, and largely with any kind of sheep that squatters could secure. The greatest single factor in the growth of Australia's wool industry was price". Broadly, he states, the two classes of animal management (extensive and intensive practices) define the limits of practicability for improvement by animal breeding. Flocks in which it is impossible to identify the progeny of individual animals are necessarily restricted to mass selection on a phenotypic basis (extensive practices). When parents of both sexes and their progeny can be identified and when the performance of all can be measured, or appraised and recorded, such flocks or herds can benefit from genotypic selection (intensive practices). The greater possibilities for improvement by the latter have been made abundantly clear. Extensive methods and intensive methods are then considered in detail. The cost of purchasing the highest classes of animals and the expenses of testing their progeny on the highest level are so great as to be beyond the range of private persons, so government enterprise is favoured. Dairy bulls must be judged by the production of their daughters. Absolute merit in a beef beast is associated with rate of gain per unit of food intake, so that it may sometimes pay better to sell for slaughter smaller beasts at two or three years of age than to wait another year for a heavier animal. There may be a big difference between the performances of stud animals under ideal conditions of food and care and under the difficult conditions of the interior with its summer heat and periods of drought. Chapters follow on artificial insemination, progeny-testing of fine-wool sheep, and finally on current research. In this final chapter, attention is called to the fact that research work in Australia on the breeding of animals hitherto has been directed predominantly to environmental causes, such as those with references to food and disease. Research on hereditary, that is, genetical, causes lags far behind that in other countries investigating problems of this nature. Only as regards sheep is there anything here approaching a series of planned genetical investigations. If Australia is to hold her own in animal husbandry, it is essential that this default should be speedily rectified. Appendices give Wright's coefficients of inbreeding and relationship, a glossary of terms and references to literature.

The term heterozygous on page 80 is not derived from Greek words meaning different eggs, but indicates that dissimilars are linked together (from ζυγόν, a yoke). Charles Darwin (page 60) was born in 1809; 1869 is an obvious typing slip.

This book will be of service to those members of the profession, their sons or relatives who are engaged in pastoral or farming pursuits. It is good to see works of this kind published in Australia. The price is very reasonable.

[1] "Principles and Methods of Animal Breeding", by R. B. Kelley, D.V.Sc.; 1946. Sydney, London: Angus and Robertson Limited. 8½" × 5½", pp. 304. Price: 15s.

Notes on Books, Current Journals and New Appliances.

CROCODILE LAND.

THE title of Mr. Idriess's latest book, "In Crocodile Land", gives it its best description, for it is a detailed account of crocodiles, their habits, their surroundings and their capture.[1] In places "the crocodile land" is a bit too vivid with a touch of horror, "the shiny, blue-grey mud with a glistening oily film to its surface" and the hideous giant reptiles that make it their home, seem to take us back to a prehistoric age.

Crocodile hunting in northern Australia as an industry sounds a skilful but dangerous calling, with the risk of hostile natives and shipwreck on an unknown reef added to the excitement of battles with enraged beasts. Much the same can be said, too, for buffalo hunting, to which the author digresses from his main subject for a few chapters. The occupations are much the same except that crocodile hunters use a boat and buffalo hunters a highly trained horse; the loss of either can be disaster to the owner.

Then there is a delightful account of the personalities of the Skipper (the owner of the boat) and the "Old Man" (the native passenger) and their open warfare; the Skipper with his noisy diatribes about the "poor down-trodden slaves" is out-manœuvred every time by the "Old Man" squatting in the bows offering his speechless passive resistance. The Skipper wins in the end, dealing his unwanted passenger a lasting defeat.

The author's facility of expression makes him at times border on the *cliché*, but the book is well bound, printed and illustrated with photographs. It is a workmanlike account of a workmanlike expedition and joins the long list of books already to the credit of Mr. Idriess.

[1] "In Crocodile Land: Wandering in Northern Australia", by Ion L. Idriess; 1946. Sydney and London: Angus and Robertson Limited. 8½" × 5½", pp. 262, with many illustrations. Price: 8s. 6d.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 14, 1946.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

TRAINING IN CHILD CARE.

THE child's rightful place is in the home, with father, mother, brothers and sisters. Amiel has said that the family may be all that is best in the world, but that too often it is all that is worst. Under the best conditions a child's development will take place up to a certain point without cause for parental uneasiness, but problems arise as most children grow up to become self-reliant young men and women. The problems arise partly because of the diversity of human nature and partly because of the speed and artificiality of modern existence. In every age parents have no doubt worried about the spiritual, mental and bodily welfare of their children, but the present age is different from those that have gone before because it is less simple—children have more and expect more, and too often what they have has come to them too easily. These are the days when child psychology is preached—inhibitions and repressions must be avoided and self-expression is the order of the day—and the fruits of this pseudo-science are to be seen on every hand. If in families that typify the best, problems are likely to centre round the growing child, it is easy to imagine that in others of a worse type the lot of the child is harder. The child without parental care and with no one who can be said to belong to him is in even worse case. Children with no home life, because they have lost their parents or for some other reason, are brought up, or indeed simply grow up, under varying conditions. Sometimes they have institutional care; sometimes not. But the result of the care that they receive, whether it is institutional or not, will depend on the wisdom, judgement and experience of their guardians. In March, 1945, the Secretary of State for the Home Department, the Minister of Health and the Minister of Education appointed a committee, of which Miss Myra Curtis, C.B.E., was chairman, "to inquire into existing methods of providing for children who from loss of parents or from any cause whatever are deprived of a normal home life with their own parents or relatives; and to consider what further measures should be taken to ensure that these children are brought up under conditions best calculated to compensate them for the lack of parental care". At an early stage of the investigations of this committee it became apparent to its members that large sections of the staff caring for such children were without any special training for the task and that this was partly responsible for the unsatisfactory standards that existed. The committee thereupon appointed a subcommittee to investigate this aspect of the question. The conclusions of the subcommittee have been adopted by the full committee and were presented to Parliament by the three Ministers concerned in March, 1946.[1]

The report deals only with one group of workers—the residential staff of the house mother type in charge of groups of children in small cottage or independent homes or as subdivisions of large establishments. This group is only one of those who are concerned in the care of children. It was chosen for first attention not only on account of the key position in relation to children of those comprising it, but also because their training is not comprehensively covered by any of the existing arrangements. This last statement, we read, is not true to the same extent of any other class of worker. Thus the non-resident "case" worker is catered for by various types of training in social work; when nursing experience is necessary, trained nurses can be appointed; and for nursery nurses and nursery assistants certain facilities exist under private auspices, and training under State auspices is about to be instituted. The only comprehensive courses of training for staff members of the house mother type that exist are arranged by certain voluntary organizations. The duties that have to be carried out by a "house mother" are almost explicit in the name of her office. She has to take charge of a family group of anything up to twelve children, varying in age from two to twelve or fifteen years. She has to act as a mother to these children, to create for them, as far as possible, the atmosphere of a good type of family home. This atmosphere should be one of affection and security, of understanding and guidance, and of training in social habits and in character. In addition to all this she has to understand the domestic household and health sides of her work; she must also be businesslike and orderly in the keeping of simple records and in the furnishing of necessary reports. There is of course a corresponding male worker in some homes, who has corresponding duties and responsibilities; but female workers are much more numerous. It is too often assumed—as those with Australian experience will agree—that no qualifications beyond personal inclination and suitability with some domestic experience and handcraft are needed. There may be certain naturally gifted persons who need no training to help them in this type of work and who will achieve success, but they must be very rare. Unless time has been spent in special study and training by those in control, children in institutions will be treated in groups and not as separate individuals. It may be held that training will make workers too academic. This is, of course, a danger, but it may be obviated, as the com-

[1] "Training in Child Care", Interim Report of the Care of Children Committee; 1946. London: His Majesty's Stationery Office. 9¼" × 6", pp. 17. Price: 3d.

mittee suggests, by selection for training of none but those of suitable personality and temperament and by the way in which training is carried out and examinations are conducted. In view of all these circumstances it is not surprising to find that the committee recommends the setting up of a central training council which shall administer a scheme of training; and a scheme for the training staff of the house mother type is suggested. The council, it is suggested, would administer such other schemes as might be added later on. It is not necessary for our present purpose to give a great deal of detail of the proposals, but reference must be made to the composition of the proposed council and to the theoretical work suggested for inclusion in the proposed scheme of training.

Bodies are named which should be asked to send nominees to the proposed council, and it is thought that these delegates should act as individuals and not as delegates of the nominating bodies. The bodies include the government departments concerned, municipal organizations, the Council of Associated Children's Homes, the British Pædiatric Association, the National Council of Social Service, the Provisional National Council for Mental Health, the National Council for Maternity and Child Welfare, the Joint University Council for Social Studies, the Association of Teachers in training colleges and departments of education, and organizations representing the employees concerned. The theoretical work, it is suggested, should include household management, care of health and prevention of disease, the study of child development, playing with children, social conditions and the social services, the general standard of culture, record keeping and household accounts and, under certain conditions, religious education.

There is a great deal more in this report than has been indicated in this short review, and those in control of child welfare departments in this country will find it worthy of careful study. Our present purpose is to show the trend of thought and purpose in Great Britain. In Australia conditions are in some respects better than they appear to be in England. In New South Wales, for example, no home for children under the age of seven years can be established without the approval and oversight of the Child Welfare Department. For children over the age of seven years there is no restriction. The Child Welfare Department has several large institutions under its control, and we understand that training is given in various ways to departmental officers of different grades. Lectures of various kinds are given at the Teachers' College and for those who cannot attend these lectures discussion groups and correspondence groups are arranged. Intensive courses of training are given to officers destined for special types of duty. The details of the arrangements need not concern us. What is important is that State organizations in the Commonwealth are fairly well provided with opportunities to train members of their staffs. For persons who do not belong to a government department the matter is more difficult, but a start has been made. In New South Wales non-departmental persons have been allowed to attend certain lectures arranged by the department, which is alive both to the needs of the situation and to its own responsibilities. No doubt in due course further developments will take place. While we may express satisfaction with what has been done in government departments, there is room for further development in their services. The report that has been described may stimulate departmental heads to further activity, and the complete report that has been foreshadowed will be awaited with interest. The present interim report also gives an indication of the kind of arrangement that would fill the gap that at present exists in the training of persons not attached to government departments.

Current Comment.

HYPERTENSION AND RENAL FUNCTION.

It has long been argued whether attempts to lower the blood pressure of hypertensives are based on sound premises, or whether there may not be some degree of risk incurred in expecting an organ such as the kidney to carry out its tasks under a head of pressure which has ceased to be adequate for it. Of course, like many hypothetical questions, this contains too many variables to make a categorical reply possible unless accurate knowledge is possessed of the functional capacity of the tissues chiefly concerned. An attempt is always made to secure such information before such radical measures as surgical interruption of parts of the sympathetic nervous chain are undertaken, and the efficiency of the kidneys is an important part of the necessary investigation. It is, however, admitted that most of the tests for estimation of renal function are relatively crude inasmuch as they reveal defects only when these are of a not inconsiderable degree. For ordinary clinical purposes this is usually sufficient, but when it is desired to make careful measurements of variations in renal adequacy following on changes in general blood pressure a more sensitive method may be necessary. This is pointed out by R. Gregory, W. C. Levin, G. T. Ross and A. Bennett in one of a series of studies on hypertension.[1]

These authors were particularly interested in the problem of determining whether any adverse change in renal function was likely to follow significant falls of blood pressure induced therapeutically in the subjects of arterial hypertension. They regarded their previous work done on the topic as open to the objection that urea clearance was not a very sensitive method, and therefore repeated it, using inulin and "Diotrast" clearances. The values for these test substances were checked in observations on patients with normal blood pressures, the figures obtained coinciding well with most of the recorded work. The patients selected for inquiry had been diagnosed clinically as suffering from essential hypertension in ten cases, and to these were added two others who undoubtedly had chronic glomerulonephritis. In these patients the fall of blood pressure obtained by inducing high spinal anæsthesia was observed. In one case there was no vasomotor response at all. In some instances the fall of pressure was brief, but it was found that when the blood pressure had fallen to a significant degree for as long as fifteen minutes an appreciable fall in the inulin and "Diotrast" clearances was also observed. Further, the degree of affection of the renal function was roughly proportionate to the amount by which the blood pressure was reduced. When the blood pressure resumed its previous levels the results of renal tests also showed a return to control levels. It must be admitted that the changes in blood pressure in these patients were striking in many of the cases. The systolic pressure was halved in a number, even though briefly, and the diastolic pressures were reduced in most by about one-third. Therefore this experiment hardly parallels other clinical experiences in therapy, since such steep falls in blood pressure might be expected to cause disturbance of functional efficiency with no adequate opportunity for adaptation. The authors believe that the

[1] *Archives of Internal Medicine*, April, 1946.

reduction in renal efficiency observed by them was directly related to the lowering of the blood pressure. The figures for filtration fractions were not quite consistent, but it is pointed out that there are a number of variable factors here, such as the differing degrees of organic change in the afferent and efferent arterioles, and the glomeruli. Nevertheless variability in these factors must be appreciated by those who undertake to attempt the lowering of blood pressure as a method of treatment; hence it must be clearly realized that in individual patients there is a renal mechanism not only quite sensitive to more or less drastic circulatory changes, but also probably affected by a degree of anatomical damage as well. There is no novelty of principle in this work, but it supplies yet another argument why the lowering of blood pressure of hypertensives, even if we suppose that this is feasible, should be carefully considered. What is needed is that the maintenance of an optimal arterial pressure should be regarded as the goal. This is doubtless an impossible ideal, but a contemplation of it may perchance stimulate as well as chasten.

FEVER AND PERIOSTEAL REACTION IN INFANTS.

JUDGED by the more sluggish adult standards, the reactions of young children to various sorts of stimulation are prone to be excessive. This is one of the many distinguishing features of health and disease in the very young which make pædiatrics a separate branch of medicine and even draw a line between the methods of handling infants and children. The literature contains many references to the periosteal reactions of children in response to infection, neoplasm and vitamin deficiency, but there would appear to be some reactions not easy to place in a definite category.

F. C. Smyth, Alice Potter and W. Silverman, of San Francisco, have studied a number of young infants presenting a symptom complex including fever, irritability and periosteal reaction.[1] They are cautious in drawing deductions from the examples seen, and invite observations elsewhere. Seven detailed case histories are presented, including the results of full clinical, pathological and radiological studies. Five of the patients were babies aged from three to seven months, one was aged two years and one two and a half years. The features common to all were fever, irritability and anæmia, in addition to the changes in some of the bony structures. The onset was early in the small infants, at two to four months of age, and the sustained nature of the febrile condition associated with a leucocytosis of a high order naturally suggested an infective cause. But in addition a remarkable mandibular swelling, involving also the soft tissues, was observed, which gave the babies a curiously similar appearance not accounted for by ancestry or other cause. The older children did not have this peculiar appearance, but all the patients showed some evidence of periosteal reaction, the amount of hyperplastic reaction being great in some cases. The authors' attention was naturally drawn to the facial changes, but they do not consider that these are an essential part of the syndrome. The sites of the periosteal swellings were the mandibles, ribs, clavicles and long bones, the shafts of the last mentioned being involved rather than the epiphyseal areas. The swellings were tender and were thus easily discovered. Biopsy showed no inflammatory changes in muscle or subcutaneous tissues, rather degeneration in the case of the former, somewhat of the type found in dystrophic states of muscle. No hæmorrhagic reactions were found, but merely periosteal new bone formation of the cortex of bone, with some fibrous reaction of the bone marrow. Radiological studies did not suggest scorbutic changes; the early subperiosteal changes were lacking, and rings of calcification were not seen nor areas of rarefaction, though the new bone was laminated. Scurvy was to be thought of, nevertheless, but observations of the ascorbic acid levels in the blood before and after the administration of vitamin *C* gave no support to this diagnosis. Further, the giving of ascorbic acid produced no therapeutic results, and relapse occurred in one infant while large doses were being administered. There was nothing to suggest trauma as a reasonable explanation, and though some of the children had upper respiratory tract infections, pulmonary osteoarthropathy was surely not the cause. The whole picture points to an infective cause, but the writers cannot enlighten us further. In spite of the massive periosteal reaction, good recoveries were eventually made in all instances, and later radiological studies showed satisfactory resolution. There is no reason to think that special measures like blood transfusion for the anæmia, or the administration of liver extract, or X radiation directed towards enlarged thymus glands found in a couple of the babies, had any particular relation to their eventual recovery. Penicillin was not tried, but sulphonamides produced no effect.

Smyth and his colleagues point out that there are affinities with both metabolic and infective disturbances in this syndrome. Some similarities to "pink disease" will be apparent; one patient had an irritable rash, though some of the usually prominent features are missing, and there are, of course, important differences. No ætiological agent could be found in the present series, though no virus studies were made. The authors have combed the literature and found a number of accounts of similar states in infants; this leads them to think that the attention they have drawn to this syndrome may result in the recognition of more cases.

[1] *American Journal of Diseases of Children*, April, 1946.

THE MECHANISM OF INVASION.

THE work of K. Meyer and his associates[1] during 1937-1940 revealed the presence of a muco-polysaccharide hyaluronic acid in the skin of mammals. The presence of a hydrolytic enzyme, hyaluronidase, in pathogenic bacteria, venoms and spermatozoa has since been demonstrated. This enzyme has been shown to be identical with the "spreading factor". F. Duran-Reynals[2] has put forward the view that the degree of invasiveness of bacteria is determined mainly by the concentration of spreading factor present at the site of infection, and that the subsequent course of the infection includes the hydrolysis of the mucoid ground substance of the connective tissue and a spread primarily through the interstitial system of the connective tissue.

Recently, E. Haas,[3] in the Worcester Foundation for Experimental Biology and the Worcester State Hospital, has taken up the interesting question: "What can the host do to combat hyaluronidase?" He calls hyaluronidase "invasin", and has shown that normal blood plasma of mammals, birds and fishes contains an enzyme, antinvasin I, which rapidly destroys hyaluronidase. It is thus an anti-invasive catalyst. In bacteria and venoms he has found an enzyme, proinvasin I, which rapidly inactivates antinvasin I. This promotes invasion by blocking the defence mechanism of the host. There is in normal plasma another enzyme, antinvasin II, which inactivates proinvasin I. A study of the hyaluronidase production by *Staphylococcus aureus* and *Clostridium welchii* indicates that other units are concerned in this aspect of infection and resistance. These enzymes are distinct from the known antibodies to the invading organisms. A considerable decrease in the concentration of antinvasin I has been observed in individuals with various infections. A few preliminary experiments with both patients and healthy individuals show a definite correlation between the physical condition of the individual and the concentration of antinvasin I. Haas concludes: "The wide distribution and reaction of antinvasin I with hyaluronidases from various sources suggest that the enzyme plays an essential role in the defence mechanism of the body by preventing invasion of certain bacteria and venoms."

[1] *The Journal of Biological Chemistry*, Volume CXXXVIII, 1941, page 491.
[2] *Bacteriological Reviews*, Volume VI, 1942, page 197.
[3] *The Journal of Biological Chemistry*, Volume CLXIII, 1946, pages 63, 89 and 101.

Abstracts from Medical Literature.

PHYSIOLOGY.

Body Cooling of Some Animals following Immersion in Water.

C. R. SPEALMAN (*The American Journal of Physiology*, May, 1946) states that rats and rabbits when immersed in water at 30° C. and below cool at a rate which is dependent upon the temperature difference between body and water. In water at 20° to 30° C., thermal equilibrium is re-established with body temperature a few degrees above water temperature. In water at 15° C. and below, these animals become unconscious before thermal equilibrium is reestablished. Large dogs do not cool in water at 20° C. or above. In water at 15° C. and below, cooling may occur, but some dogs can maintain a normal body temperature for at least five hours in water at 0° C. Dogs become seriously affected when rectal temperature declines to about 27° C. Men do not appear to be much more resistant to cooling by water than are large dogs. Both manifest considerable individual variation in resistance to cooling by water.

Performance as Related to Composition of Alveolar Air.

A. B. OTIS, H. RAHN, M. A. EPSTEIN AND W. O. FENN (*The American Journal of Physiology*, May, 1946) report that performance (contrast discrimination test and steadiness test) and heart rates of eleven subjects were measured over a wide range of alveolar oxygen and carbon dioxide tensions. A total of 171 half-hour experiments and 85 control runs were made. The results are plotted on an alveolar pCO_2-pO_2 grid, and regions of normal performance and of various kinds of impaired performance are indicated. A method for analysing performance impairment into anoxic and acapnic components is described. The results indicate the following conclusions. Acapnia and anoxia are additive rather than antagonistic in their effects on performance. There exists at each altitude an optimum alveolar gas composition for best performance. This optimum may be different for different types of performance. Heart rate is increased by anoxia, but is not consistently affected by acapnia. Performance impairment in most individuals breathing naturally at air-breathing altitudes is essentially a matter of anoxia alone.

The Role of Exercise in Altitude Pain.

F. M. HENRY (*The American Journal of Physiology*, January, 1946) reports that a group of young men were exposed a total of 390 times to a reduced barometric pressure equivalent to an altitude of 38,000 feet in order to determine the aspects of muscular exercise that effect the occurrence of altitude joint pain (aviators' bends). Pure oxygen was supplied so that alveolar oxygen was maintained at normal ground level tension. While at the simulated altitude, the men performed one or another of six arm exercises designed to separate out factors such as continuous and intermittent strain, total work and angular joint movement. The results lead to the following conclusions. Pain occurs in unexercised limbs, but is much more common and more severe in exercised limbs. Onset time, incidence and severity of pain are systematically related to total work (in foot-pounds). There is an indication that the occurrence of mild pain is differentially affected by small amounts of work, but not further increased at the highest work level studied. Muscle strain, mechanical tension and amount of joint movement do not determine the occurrence or severity of pain. This is true for both continuous and intermittent tension. The results support a theory that increased local carbon dioxide production is principally responsible for the effects of exercise on the occurrence and severity of altitude pain.

The Initiation of Sweating in Response to Heat.

E. F. ADOLPH (*The American Journal of Physiology*, March, 1946) reports that the rates of evaporative loss were measured in men initially exposed to hot dry air (122° F., 10% humidity). A probable increase in rate of evaporation due to sweating, amounting to two and a half fold, occurred within the five minutes before the men could be weighed. The measured acceleration began at seven minutes in one subject and twelve minutes in another subject. The rates rapidly increased to a maximal rate of tenfold above that in a cool atmosphere, which was attained in twenty minutes. It is concluded that the promptness of onset of sweating among individuals is no indication of their tolerance or acclimatization to heat. The slow onset of full sweating suggests that the stimulus required is an appreciable increase in the heat content of the body as a whole.

The Action of Cardiac Ejection on Venous Return.

H. A. BLAIR AND A. M. WEDD (*The American Journal of Physiology*, February, 1946) discuss the mechanical relations existing between cardiac ejection, lung air pressure, chest wall movements and venous return. The excess of arterial outflow over venous inflow to the chest during systole tends to create a partial vacuum with a pressure of about 15 millimetres of mercury in the lungs. Collapse of the chest wall, however, permits only a small fraction of this pressure to be realized, about 0·5 millimetre of mercury according to derivations from measurements of transient increase of body volume with each heart beat. This partial vacuum will assist venous return, but it is not nearly so important as the negative intrapleural pressure in performing this function. The relative sizes of cardiac stroke volume and lung volume determine the partial vacuum which tends to be created in the lungs by the heart beat, and therefore the potential aspirating forces on venous blood and chest wall. The ratio of cardiac stroke volume to lung volume is approximately constant in warm-blooded animals. Consequently, the relative mechanical effects of ejection are similar in animals of all sizes. Decrease of lung volume caused by accumulation of blood in the chest and the accompanying changes of elasticity may be expected to increase the aspirating action of arterial ejection. That this occurs is not proven directly, but it is shown that the normal mechanical relations may be greatly altered in valvular disease of the heart. In advanced mitral stenosis, for example, the chest may expand rather than contract during systole.

Anoxia and Brightness Discrimination.

S. HECHT, C. D. HENDLEY, S. R. FRANK AND C. HAIG (*The Journal of General Physiology*, May, 1946) report the results of experiments in which brightness discrimination has been studied with individuals breathing oxygen concentrations corresponding to seven altitudes between sea level and 17,000 feet. The brightnesses were 0·1, 0·01 and 0·001 millilambert involving only daylight (cone) vision. At these light intensities, brightness discrimination begins to deteriorate at fairly low altitudes. The deterioration is obvious at 8,000 feet, and becomes marked at 15,000 feet, where at low brightness the contrast must be increased 100% over the sea level value before it can be recognized. The impairment of brightness discrimination with increase in altitude is greater at higher altitudes than at lower. The impairment starts slowly and becomes increasingly rapid the higher the altitude. Impairment of brightness discrimination varies inversely with the light intensity. It is most evident under the lowest light intensities studied, but shows in all of them. However, it decreases in such a way that the deterioration is negligible in full daylight and sunlight. The thresholds of night (rod) vision and day (cone) vision are equally affected by anoxia. The quantitative form of the relation between brightness discrimination $\Delta I/I$ and the prevailing brightness I remains the same at all oxygen concentrations. The curve merely shifts along the log I axis, and the extent of the shift indicates the visual deterioration. The data are described in terms of retinal chemistry. Since anoxia causes only a shift in log I, it is shown that the photochemical receptor system cannot be affected. Instead the conversion of photochemical change into visual function is impaired in such a way that the conversion factor varies as the fourth power of the arterial oxygen saturation.

BIOCHEMISTRY.

Sulphonamides.

K. H. BEYER *et alii* (*The Journal of Laboratory and Clinical Medicine*, January, 1946) have studied the formation and elimination of acetylated sulphonamides. Sulphathiazole is conjugated in the body at a considerably greater rate and to a greater extent than are the pyrimidine derivatives. Of the latter group, sulphamethazine is conjugated most rapidly and to the greatest extent. At a given plasma concentration both the free and conjugated sulphonamides are bound to approximately the same extent on plasma proteins. This is especially true for human plasma albumin and less true for dog plasma which normally binds sulphonamides to a lesser extent.

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METHYL THIOURACIL

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"PALATINOID" "IOSAL" (O.S. & Co.) No. 7190

℞ *Alphidine* - *gr.* ½
Thyroid - - *gr.* ½
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The formula of this Palatinoid was suggested to us by Dr. Watt, of Guy's Hospital, London, and, in the opinion of leading Practitioners, it has proved the most valuable addition to Rheumatism therapy of recent years, and especially so in the case of elderly people. In menopausal Rheumatism and allied conditions, the results are of outstanding excellence, as evidenced by the case histories available.

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In the Rheumatoid group this Palatinoid is described as the "Alphidine" Spa Treatment. In cases of Arthritis with thickening and set joints it has proved particularly effective. Its use in conjunction with Iodo-Salve as a topical application has been the subject of many favourable reports.

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The renal clearances of all the acetylated sulphonamides tested were greater than those of the unconjugated form, the clearance of acetylsulphathiazole being by far the greatest. Even though the clearances of the compounds, except for acetylsulphamethazine, approximated or exceeded the glomerular filtration, sodium bicarbonate or the production of diuresis increased still further the clearances of all the sulphonamides. Thus these measures for the minimizing of sulphonamide renal complications appear to impede the probably passive reabsorption of the compounds. It follows from a consideration of these results that the plasma concentration of the acetylated forms of these agents should fall more rapidly after a single standard parenterally administered dose than after the injection of the unconjugated form of the agents. This was found to be true.

Œstrogens.

W. H. McSHAN AND R. K. MEYER (*Archives of Biochemistry*, March, 1946) have shown that diethyl-stilbœstrol, hexœstrol and dienœstrol are effective inhibitors of the succinic oxidase system. The effectiveness of diethyl-stilbœstrol increased with increasing concentration until, with proper concentration, complete inhibition was attained. The maximum effect of the hormone is exerted soon after it is mixed with the enzyme. It was shown that the inhibition by diethyl-stilbœstrol was effected through the cytochrome oxidase system. Compounds having one phenolic group and less activity in the œstrogenic sense are also less effective as inhibitors, and when both phenolic groups of the stilbœstrols are replaced by oxyacetate groups, little, if any, inhibition is obtained.

Transamination.

D. E. GREEN *et alii* (*The Journal of Biological Chemistry*, December, 1945) have announced the isolation and properties of two transaminating enzymes from pig heart. The aspartic-glutamic enzyme catalyses the transfer of amino groups from oxalacetate to glutamate or from aspartate to α-keto-glutarate. The alanine-glutamic enzyme catalyses the transfer of amino groups from pyruvate to glutamate or from alanine to α-keto-glutarate. Both of these enzymes have been purified to a point at which all the protein present has enzymatic activity. Evidence has been presented which points to pyridoxal phosphate as the prosthetic group of both transaminating enzymes. It is a derivative of pyridoxine, a component of the vitamin B_2 complex.

Thyroxine.

E. P. REINCKE AND C. TURNER (*The Journal of Biological Chemistry*, December, 1945) have examined the effect of a number of factors on the formation of thyroxine in iodinated casein. It was shown that, subsequent to the iodination of the protein, the amount of thyroxine formed is increased markedly by increasing the incubation temperature and agitating the solution very vigorously. The principal effect of agitation is believed to be the incorporation of atmospheric oxygen which then brings about oxidative coupling of two molecules of di-iodotyrosine within the protein to form thyroxine. The formation of thyroxine is shown to be catalysed by a series of manganese compounds. From these results, together with the reported capacity of the thyreoid for storing manganese, it is suggested that manganese may act catalytically *in vivo* as well as *in vitro* in promoting the oxidative formation of thyroxine in the thyreoid gland.

Acetyl Choline.

D. NACHMANSOHN *et alii* (*The Journal of Biological Chemistry*, May, 1946) have studied the formation of acetyl choline in the nerve axone. Choline acetylase has been extracted from the sciatic nerve of the rabbit. The presence of the complex energy-requiring enzyme system in the nerve axone, that is, that part of the neurone which does not contain nerve endings and cell bodies, is further support for the assumption that acetyl choline may be essential not only for the transmission of the nerve impulse across the synapse, but also for its propagation along the axone. In the degenerating nerve fibre the enzyme activity decreases slowly. Forty-eight hours after section only 20% to 25% of the initial activity is lost. At that time conductivity is still possible. Seventy-two hours after section, when conductivity has disappeared, the enzyme activity has decreased by two-thirds. No enzyme was found six days following section. The results are consistent with the assumption that the release of acetyl choline is associated with conductivity.

Vitamin K.

A. J. QUICK (*The Journal of Laboratory and Clinical Medicine*, January, 1946) has reported that synthetic vitamin *K* compounds (menadione, synkayvite and hykinone) given in relatively large single doses caused no demonstrable hyperprothrombinæmia in rabbits, dogs or man. Vitamin *K* did not elevate the prothrombin of one individual who has a consistent level of approximately 45%. Since the patient's mother and sister likewise have the same concentration of prothrombin, it can be concluded that this trait is congenital and hereditary. The condition should be called congenital hypoprothrombinæmia. Quinine sulphate in daily doses of 0·33 gramme caused no decrease in the prothrombin content of the blood.

Fatty Liver.

P. HANDLER (*The Journal of Biological Chemistry*, January, 1946) has shown that the administration of biotin *plus* a basal *B* vitamin supplement to rats which had previously been fed a low protein diet with no *B* vitamins, resulted in fatty livers, despite the presence of adequate amounts of dietary choline. This was accompanied by a considerable increase in food consumption and growth. The further addition of folic acid accentuated these phenomena, although folic acid without biotin did not produce these effects. Inositol prevented the accumulation of liver fat, without affecting either appetite or the growth rate. When a relatively high fat diet *plus* the basal *B* vitamin supplement was given to previously depleted rats, inositol was again found necessary to maintain normal liver lipid concentrations, even in the absence of supplementary biotin, folic acid or liver extract, and the effects of biotin *plus* folic acid were even more pronounced on this diet. However, if the experiments were continued for twenty-four days, choline alone sufficed to provide normal liver fat concentrations, as the food consumption and growth rate declined after the first week with a consequent decrease in the demand for dietary lipotropic factors to a level at which the supply of inositol from synthesis by the intestinal flora was sufficient to meet the inositol requirement. When sulphasuxidine was included in both the depletion ration and the experimental diet, the effects of the biotin and folic acid combination were again manifest, but neither alone markedly affected appetite, growth or liver lipid concentrations. However, the demand for dietary inositol was still apparent even after twenty-four days, presumably because of inhibition of intraintestinal synthesis. The inhibition of the lipotropic action of inositol was obtained for a synergistic activity of inositol and tocopherol in this system, although tocopherol of itself exerted no apparent lipotropic activity.

Ketosis.

H. C. TIDWELL AND C. R. TREADWELL (*The Journal of Biological Chemistry*, January, 1946) have shown that various dietary levels of fat, ranging from traces to 63% of the preceding diet, or changes in the fat from 38% to 83% of the caloric intake, with protein intakes the same, produced no significant differences in the blood ketone levels during the following fasting periods. Low protein intakes were associated with a following fasting ketosis significantly higher than that after the ingestion of one gramme or more of protein per day for each 100 grammes of body weight. The preceding protein intake appears to be the major dietary factor affecting the degree of the following fasting ketonæmia. The effect of the preceding intake upon the fasting ketosis can be explained by an increased utilization of carbohydrate in the animals on a low protein diet as well as by a lack of antiketogenic material during fasting due to the absence of sufficient protein stores.

Liver Function.

C. D. COOKE AND F. HOFFBAUER (*The Journal of Laboratory and Clinical Medicine*, January, 1946) have studied twelve patients with therapeutic malaria before, during and after the malaria with regard to liver function. Four laboratory tests, the cephalin-cholesterol flocculation test, the quantitative serum bilirubin estimation, the quantitative Ehrlich reaction and the bromsulphalein test, were used. Alternate patients, six of the twelve, were given 8·1 grammes of methionine orally per day in addition to a general hospital diet. The other six served as controls and received the same diet without extra methionine. All of the twelve patients studied exhibited some evidence of disturbed hepatic function as measured by the four tests. In ten of the twelve patients there were functional abnormalities from one to three days after the termination of the malaria. The daily addition of methionine to the diet failed to provide any evidence of protection of liver function.

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British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on June 20, 1946, at the Royal North Shore Hospital of Sydney. The meeting took the form of a number of clinical demonstrations by members of the honorary medical staff of the hospital. Parts of this report appeared in the issues of July 27, August 3 and September 7, 1946.

Adenocarcinoma of the Recto-Sigmoid Junction.

DR. H. HUNTER JAMIESON showed a female patient, aged fifty-four years. She had been receiving liver therapy for anæmia for two and a half years. For twelve months the patient had suffered from intermittent hæmorrhage from the rectum; she passed clots of bright red blood the size of a man's fist. The rectum always felt distended. The patient felt as if she wanted to have her bowels open all the time; the bowel habit alternated between constipation and diarrhœa. For the preceding three weeks the fæces had been red-brown and soft, and the patient went to stool six times a day. She had gained two stone in weight in two and a half years, since the inception of liver therapy. She had suffered from lateral sclerosis, which cleared up with liver therapy. She suffered from dyspnœa on exertion, but had no palpitation, no swelling of the legs and no cough. Her appetite was good. Sometimes she suffered from dysuria; she passed urine six times during the day and once at night. Examination of the central nervous system revealed no headache or other abnormality.

On examination, the patient was a healthy looking woman. The systolic blood pressure was 138 millimetres of mercury and the diastolic pressure 78. The apex beat was in the fifth left intercostal space, four and three-quarter inches from the mid-line. The heart sounds were normal. No respiratory abnormality was detected. The mouth was healthy. Slight tenderness was elicited over the left iliac fossa; no abdominal masses and no viscera were palpable. The central nervous system appeared normal. X-ray examination on November 21, 1945, after a barium enema, revealed no obstruction as far as the splenic flexure.

On November 29 a painful, tender, red lump developed in the right breast, and the diagnosis of mastitis was made. On November 30 a sigmoidoscope was passed for a distance of fifteen to eighteen centimetres; at that point normal mucous membrane was replaced by a mass on the right postero-lateral aspect of the sigmoido-rectal wall. The mass was thought to be neoplastic, and a biopsy specimen was taken; examination of the tissue revealed the appearances of adenocarcinoma.

On December 13 operation was performed and a colostomy was established, and on December 17 penicillin therapy was begun. On January 10, 1946, resection of the growth was carried out without any untoward happenings. On February 9 the patient was referred by Dr. H. Ham to the deep X-ray therapy department of Sydney Hospital. At operation on December 13, 1945, the first stage of an abdomino-perineal resection was carried out and a left inguinal colostomy was established. An annular neoplasm was present two inches above the recto-sigmoid junction. The abdomen was opened by a lower mid-line incision in the usual way; the incision passed through the skin, subcutaneous fat, *linea alba*, extraperitoneal fat and peritoneum. The liver surface was examined for neoplastic metastases, but none were found. The glands of the abdomen and pelvis were not involved by metastases as far as could be determined. The neoplasm, which was situated above the recto-sigmoid junction, was mobile and not fixed to any of the surrounding structures. The iliac portion of the colon was mobilized and divided between ligatures; the distal portion was invaginated, while the proximal portion was delivered through an opening made in the abdominal wall at the outer border of the left *rectus abdominis* muscle midway between the *symphysis pubis* and the umbilicus. The divided ends of the colon were treated with carbolic acid and then spirit. The peritoneum was sutured around the delivered portion of the colon by interrupted catgut sutures, and the rectal sheath was sutured around the colon by interrupted sutures. The subcutaneous fat of the left abdominal wound was sutured with interrupted catgut sutures. The skin was closed around the colostomy by white silk sutures. The colostomy was closed by one straight Kocher's forceps held in place by white silk sutures. The mid-line wound was closed layer by layer with chromicized catgut. The peritoneum was closed by interrupted sutures, while the rectal sheaths were brought together by a continuous suture; subcutaneous fat was closed by a continuous suture. Three deep sutures of silkworm gut were inserted. The skin was closed with a continuous white silk suture. "Vaseline" gauze was placed around the colostomy, and the patient was returned to bed in good condition.

On January 10, 1946, a further operation was performed. A mid-line incision was made through the skin, *linea alba* and peritoneum. Adhesions were freed, and the mesocolon of the sigmoid and the rectum was divided between ligatures. The sigmoid and the upper portion of the rectum were removed. The rectum was closed by catgut and silk sutures, and the upper end was covered by peritoneum. Hæmostasis was secured. The abdominal wall was closed in layers with chromicized catgut. The patient's condition was good. The pathological condition found was the same as before; one enlarged gland was also discovered in the mesocolon. A gland and a section of the growth were sent for pathological investigation.

Adenocarcinoma of the Colon with Obstruction.

DR. C. H. WICKAM LAWES showed a female patient, aged forty-nine years, who had been admitted to hospital on January 11, 1946; she had suffered from abdominal pain and constipation for two weeks and from vomiting for three days. The pain was severe, and griping and colicky in type. The bowels were open only when enemata were given. The vomiting was intermittent, and was usually associated with attacks of colicky pain.

On examination of the patient, tenderness was present in the left hypochondrium. On July 14 a plain X-ray examination revealed dilatation of the large bowel with a fluid level, and X-ray examination after a barium enema revealed an obstruction near the splenic flexure. Thirteen years previously the patient had undergone appendicectomy and anterior fixation of the uterus, and five years later she had been operated on for the relief of intestinal obstruction due to adhesions. The cause of the present obstruction was in doubt, owing to her previous history. It was hoped that the obstruction was due to adhesions, and that resection would be unnecessary. These hopes were not realized.

Laparotomy was performed on January 24. A hard mass was found in the splenic third of the transverse colon. No secondary deposits were detected in the liver. The decision was made to perform the operation in three stages. At the first stage the growth and a length of bowel were resected and a double-barrelled colostomy was established. At the second stage, on February 21, the spur was clamped. At the third stage, on March 21, the colostomy was closed. The patient was discharged from hospital on April 9. A pathological examination of the resected bowel was made; macroscopically, the specimen was seen to consist of 22 centimetres of colon with a ring-like construction; microscopic examination showed the lesion to be an adenocarcinoma.

Dr. Lawes remarked that there were several interesting points in the case under discussion. In the first place, the plain X-ray examination was made with the patient standing. The diagnosis and the type of operation to be performed presented problems. The time-intervals between the stages of the operation were as recommended by Paul in his original description.

Orbital Cellulitis.

DR. A. L. CLOWES, on behalf of DR. E. P. BLASHKI, showed a female patient, aged sixty years, who had been admitted to hospital on January 22, 1946, suffering from orbital cellulitis and osteomyelitis of the left maxilla and around the left frontal sinus, following tooth extraction some weeks previously. From December 28, 1945, to January 1, 1946, she had been unsuccessfully treated by evacuation of pus from the lower eyelid and by the intramuscular administration of penicillin.

On examination of the patient, her left eye was closed and the region was bathed in pus; pronounced osteomyelitis of the left maxilla and of the left ethmoid and left frontal sinuses was present; she also had orbital cellulitis. Operation was performed on January 23. The performance of a left radical antrostomy revealed necrotic mucous membrane and a fistula through the roof of the antrum to the orbit; *Staphylococcus albus* was grown in culture. A left external ethmoidotomy was performed, and necrotic ethmoid cells filled with pus were removed. From January 23, 1,400,000 units of penicillin were given parenterally. On February 6

antral lavage was performed, and the irrigating fluid remained clear. The patient made an uneventful recovery and was discharged from hospital two weeks after operation.

Diverticula of the Œsophagus.

Dr. Clowes, on behalf of Dr. Blashki, also showed a male patient, aged sixty-one years, who in 1932 complained of regurgitation of food fifteen to thirty minutes after it had been swallowed; this applied especially to meat. On September 25, 1935, a two-stage operation for the radical cure of an œsophageal diverticulum was begun by Dr. E. M. Humphery. At the first stage a diverticulum was isolated with the aid of the œsophagoscope, and then covered with a rubber glove finger, which was sutured to the skin. At the second stage, on October 3, 1945, the pouch was isolated and a large diverticulum removed. The mucous membrane and the muscle layers were approximated after the stump had been invaginated. Water was given by mouth, and six ounces of 10% glucose solution were given every six hours *per rectum*. On October 27, 1935, the patient was discharged from hospital; his wound was healed and his symptoms had apparently been alleviated.

On September 30, 1936, he was readmitted to hospital with a return of symptoms. On October 1 operation was performed by Dr. Humphery. A pouch behind the œsophagus, just below the level of the cricoid cartilage, was densely adherent to the surrounding structures. The pouch was dissected out, a suture was passed around it at the base, and the whole was twisted and stitched high up behind the œsophagus. When the patient was discharged from hospital one month later, he had no difficulty in swallowing solid food.

Bronchogenic Carcinoma Treated by Pneumonectomy.

DR. COTTER HARVEY, DR. G. BRUCE WHITE, DR. C. G. BAYLISS AND DR. M. P. SUSMAN showed a male patient, aged fifty-four years, who had been admitted to hospital on January 17, 1944; he gave a history of cough with pain in the chest, of fourteen months' duration. One month before his admission to hospital he had had an hæmoptysis, coughing up about half an ounce of blood, and a further hæmoptysis had occurred in the following week. On January 6 a bronchoscopic examination revealed a white object obstructing the bronchus of the lower lobe of the left lung; it bled when touched. On January 21 a piece of this tissue was successfully removed for biopsy. Microscopic examination of sections revealed cartilage and connective tissue with a small area of lining epithelium, in which a carcinoma had developed.

Prior to operation artificial pneumothorax was induced on the left side. Left pneumonectomy was performed under nitrous oxide and oxygen with cyclopropane anæsthesia on February 3. On February 7 the signs in the right side of the chest were normal, except for occasional râles; the patient felt well. On February 8 an X-ray examination revealed a collection of fluid in the left pleural cavity, at about the level of the fourth rib. On March 13 the patient was febrile, and pus was aspirated from the left side of the chest. Thoracotomy was performed, the tube being left *in situ*. By April 2 the temperature was normal and there was very little drainage from the tube.

It was stated that since then the patient had suffered from some degree of dyspnœa on exertion and from frequent severe headache. Careful neurological and ophthalmological examination had failed to reveal any evidence of cerebral metastases from the original lung lesion as a cause of the headache.

Carcinoma of the Lung Treated by Pneumonectomy.

Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman also showed a male patient, aged fifty-three years, who had been admitted to hospital on March 23, 1946; he had suffered from morning cough with blood-streaked sputum for three or four weeks. He had suffered from night sweats for several months, and had felt tired and lacking in energy for several weeks. A bronchoscopic examination was performed on March 28; a mass was found in the bronchus of the upper lobe of the right lung, and a portion was removed. Examination of the specimen revealed appearances highly suggestive of a pulmonary neoplasm. On March 26 artificial pneumothorax was induced on the right side, prior to the performance of pneumonectomy. On April 8 right pneumonectomy was performed. Pathological examination of the lung revealed a highly cellular tumour; many oat-shaped cells occupied the whole of the upper lobe. Practically no post-operative pyrexia occurred. On April 10 the patient became breathless. Râles and rhonchi were widespread over the left side of the chest. A considerable amount of fluid was aspirated through a tube inserted into the trachea, and great relief was afforded. On April 13 a further aspiration was carried out in the same manner, and once more the patient was much relieved. Penicillin was given into the pleura every second day for three weeks. On May 9 the patient was discharged from hospital, feeling well; X-ray examination revealed a level of fluid up to the clavicle.

Another patient shown by Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman was a male, aged fifty years, who had begun to suffer from tiredness, lassitude and loss of weight about one year previously. A dry cough had developed at about the same time, and he had three attacks of "pneumonia" between October, 1945, and January, 1946. A bronchoscopic examination revealed a tumour in the bronchus to the lower lobe of the right lung; microscopic investigation of a piece of tissue removed showed the tumour to be a carcinoma. On April 28, 1946, the patient coughed up a cupful of pus and smaller amounts over the next two days; he then felt much better. He had never had hæmoptysis or pain in the chest. The patient was admitted to hospital on May 15, and artificial pneumothorax was induced on the right side prior to pneumonectomy. Right pneumonectomy was performed on May 27 under anæsthesia with "Pentothal", cyclopropane, ether and oxygen. Four ounces of "Monacrin" and 500 millilitres of serum were placed in the pleural cavity, as well as 60,000 units of penicillin. It was stated that since the operation the patient had received intrapleural injections of 50,000 units of penicillin, at first every second day, then every week. He also received 200,000 units of penicillin intramuscularly every eight hours for six days. X-ray examination revealed a level of fluid up to the clavicle.

The next patient shown by Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman was a male, aged forty-three years, who had been admitted to hospital on June 29, 1945, complaining of cough, dyspnœa on the least exertion, weakness and headache, of twelve months' duration. No acid-fast bacilli were detected in the sputum, but it yielded a growth of *Bacillus pyocyaneus* on cultivation. The blood sedimentation rate was eight millimetres in one hour. On July 5 a bronchoscopic examination revealed a neoplasm, which was still confined to the basal bronchus of the lower lobe of the right lung. On July 9 artificial pneumothorax was established on the right side prior to pneumonectomy. On July 12 right pneumonectomy was performed after a blood transfusion had been begun. After operation a pleural effusion appeared on the right side; some fluid was aspirated every few days, and penicillin was injected intrapleurally. On September 27 thoracotomy was performed and purulent pleural fluid was aspirated; the patient, who had been febrile, then felt much better. He was discharged from hospital on November 15, 1945. Pathological examination of the lung revealed bronchogenic carcinoma.

Contact Tuberculosis.

Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman then showed a female patient, aged twenty-five years, who had first been examined in August, 1938, at the age of seventeen years, as a contact of a tuberculous mother. The Mantoux test produced a strongly positive reaction. X-ray examination revealed no abnormality. In November, 1940, dry pleurisy was noted; X-ray examination revealed early bilateral infiltration. The patient's weight was ten stone ten pounds. Since then repeated X-ray examinations had revealed waxing and waning of the disease. At the time of the meeting the patient was symptom-free.

Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman next showed a female patient, aged sixteen years, who had first been examined in 1933, at the age of six years, as a contact of a tuberculous mother. The Mantoux test produced a strongly positive result; X-ray examination revealed no abnormality. In 1940 an X-ray examination revealed what were thought to be multiple healed, primary, tuberculous lesions. A further X-ray examination early in 1944 revealed an early lesion at the apex of the left lung. The patient was reported as suffering from tuberculosis and transferred to a sanatorium, where she spent twelve months and gained two and a quarter stone in weight. In June, 1945, an advance in the lesion was noted radiologically; the patient said that she was "feeling marvellous". Crushing of the phrenic nerve was performed. In January, 1946, a further advance in the lesions and cavitation were noted. In May, artificial pneumothorax was induced on the left side. The patient had had no symptoms at any time.

Another patient shown by Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman was a male, aged fifteen years, who had first been examined at the age of ten years in January,

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1940, as a contact of a tuberculous father. The Mantoux test produced a strongly positive reaction, but no abnormality was apparent in the X-ray films. In February, 1942, an early lesion was detected in the upper zone of the right lung; this was held well in check until an appendicectomy was performed in November, 1944. In January, 1945, extension of the lesion with a tendency to calcification was noted. In March, 1945, the patient was admitted to hospital for the induction of artificial pneumothorax. Since then he had remained well and free from symptoms; his weight had increased from nine stone four pounds to ten stone five pounds. The artificial pneumothorax was being maintained. The patient had had no symptoms at any time.

The next patient shown by Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman was a male, aged thirty years, who had been first examined in 1925, at the age of ten years, as a contact of a tuberculous father. The Pirquet test produced a strongly positive reaction, but X-ray examination revealed no abnormality. In 1935 the radiological appearances were still normal; the patient was not seen for the next six years. In 1940 he tried to enlist in the Australian Imperial Force, but was rejected; in 1941 he was rejected on attempting to enlist in the Royal Australian Air Force; but he spent six months in a universal training camp. In November, 1941, an early lesion was detected in the upper lobe of the left lung. The patient spent fifteen months in a sanatorium. In 1943 he worked for twelve months. In March, 1944, X-ray examination revealed a slight advance in the lesion. He was transferred to another sanatorium for two years. Artificial pneumothorax was induced in November, 1945. At the time of the meeting the patient was receiving a special pension of £4 16s., which would probably continue for the rest of his life. He had had no symptoms at any time. During an attack of influenza at the first sanatorium to which he was sent, his sputum was found to contain Koch's bacillus.

Chronic Lung Abscess.

Dr. Harvey, Dr. White, Dr. Bayliss and Dr. Susman finally showed a male patient, aged thirty-eight years, who had been admitted to hospital on February 27, 1946, complaining of cough and loss of weight of twelve months' duration. For six months he had also suffered from dyspnœa of effort and anorexia with morning cough and sputum. He had suffered from bronchial asthma as a child, and had had contact with pulmonary tuberculosis. He was febrile on his admission to hospital, and had not responded to a course of sulphadiazine therapy. On examination of the sputum, no acid-fast bacilli, no likely pathogens and no fungi were detected. On March 1 the blood sedimentation rate was 19·5 millimetres in one hour (Westergren), and the hæmoglobin value was 85%. The leucocytes numbered 10,600 per cubic millimetre, 78·5% being neutrophile cells and 14·5% lymphocytes; no eosinophile cells were seen. X-ray examination of the chest revealed appearances suggestive of tuberculous lesions in both lungs and of pneumonia. Bronchoscopic examination revealed an abscess in the bronchus to the upper lobe of the left lung; this was aspirated, and the patient was given a course of penicillin treatment. His elevated temperature subsided, and X-ray examination revealed improvement. He was discharged from hospital on April 13, with instructions to attend the clinic for observation. Examination of the sputum for Koch's bacillus and a guinea-pig inoculation test gave negative results.

On May 8 the cough was growing worse and the amount of sputum was increasing. X-ray examination of the chest revealed further extension of infiltration on the left side, and also widespread lesions on the right side. On May 11 the patient had an hæmoptysis, and he was readmitted to hospital on May 15. No likely pathogens were grown from a swabbing taken from the left main bronchus on May 18. The leucocytes then numbered 16,950 per cubic millimetre, 71% being neutrophile cells. He then became slightly cyanosed and breathless, even at complete rest, and some œdema of the feet was present. These signs gradually disappeared, and at the time of the meeting the patient felt much better. Radiological examination revealed complete disappearance of the lesions on the right side of the chest, and those in the left lung had greatly diminished. Koch's bacillus had never been detected in the sputum. The rapid disappearance of the widespread lesions in both lungs was thought to preclude tuberculosis as the cause of the condition. Boeck's sarcoidosis also was not considered likely to have disappeared so rapidly. As the patient was known to suffer from bronchial asthma, the possibility of allergic pneumonitis had to be considered. This was not excluded by the absence of eosinophilia.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed, or will resume, civil practice as from the dates mentioned:

Dr. L. W. Middleton, Murrurundi, New South Wales (July 6, 1946).

Dr. B. H. Peterson, Emmaville, New South Wales (September 14, 1946).

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 162, of August 29, 1946.

AUSTRALIAN MILITARY FORCES.

Australian Army Medical Corps.

NX445 Lieutenant-Colonel (Temporary Colonel) E. Ford, O.B.E., relinquishes the appointment of Director of Hygiene, Pathology and Entomology, Medical "A" Branch, Army Headquarters, and is placed upon the Regimental Supernumerary List, 31st May, 1946.

VX108488 Lieutenant-Colonel M. M. Rosenfield relinquishes command of 111th Australian General Hospital and is placed upon the Regimental Supernumerary List, 31st May, 1946.

NX141960 Captain J. McB. White ceases to be seconded, 3rd July, 1946.

QX6439 Lieutenant-Colonel N. H. Morgan is placed upon the Regimental Supernumerary List, 31st May, 1946.

WX1526 Lieutenant-Colonel (Temporary Colonel) H. M. Trethowan relinquishes the appointment of Deputy Director of Medical Services, Headquarters, Western Command, and the rank of Temporary Colonel, and is transferred to the Reserve of Officers (Australian Army Medical Corps) with the rank of Lieutenant-Colonel and is granted the honorary rank of Colonel, 30th April, 1946.

QX6154 Lieutenant-Colonel D. G. Croll is transferred to the Reserve of Officers (Australian Army Medical Corps), 18th May, 1946.

To be Temporary Colonel, 31st May, 1946.—QX46759 Lieutenant-Colonel C. E. S. Jackson.

101*st Australian General Hospital* (*Australian Imperial Force*): *To be Temporary Major*, 14*th February*, 1946.—NX70975 Captain W. K. Manning.

106*th Australian General Hospital*.—SX34532 Captain M. K. Smith is placed upon the Regimental Supernumerary List, 16th May, 1946.

No. 113 (*Concord*) *Military Hospital*: *To be Temporary Major*, 30*th May*, 1946.—NFX117870 Captain M. G. Lusby.

118*th Australian General Hospital* (*Australian Imperial Force*): *To be Temporary Major*, 30*th May*, 1946.—NX203294 Captain J. Colclough.

WX 3326 Lieutenant-Colonel L. E. Le Souef, E.D., is transferred to the Reserve of Officers (Australian Army Medical Corps) and is granted the rank of Honorary Colonel, 22nd May, 1946.

V5761 Lieutenant-Colonel (Temporary Colonel) H. H. Turnbull relinquishes the appointment of Consulting Physician, Medical "A" Branch, Army Headquarters, and is placed upon the Regimental Supernumerary List, 17th May, 1946.

NX102477 Lieutenant-Colonel K. A. McGarrity relinquishes command of 103rd Australian Convalescent Depot and is placed upon the Regimental Supernumerary List, 10th May, 1946.

NX70456 Major (Temporary Lieutenant-Colonel) A. C. R. Sharp relinquishes command of 2nd/6th Australian Field Ambulance, 3rd June, 1946.

NX130933 Major (Temporary Lieutenant-Colonel) T. W. Freeman is appointed to command 103rd Australian Convalescent Depot, 10th May, 1946.

NX12269 Major S. J. M. Goulston, M.C., is placed upon the Regimental Supernumerary List, 3rd June, 1946.

VX51843 Major (Temporary Lieutenant-Colonel) K. B. Brown is placed upon the Regimental Supernumerary List, 17th May, 1946.

The notification respecting NX203622 Captain J. G. O'Neill, which appeared in Executive Minute No. 116 of 1946,

promulgated in *Commonwealth Gazette* No. 100 of 1946, is withdrawn.

VX165 Lieutenant-Colonel S. W. Williams is transferred to the Reserve of Officers (Australian Army Medical Corps), 14th May, 1946.

QX44608 Lieutenant-Colonel D. F. Millar is transferred to the Reserve of Officers (Australian Army Medical Corps), 18th May, 1946.

No. 113 (*Concord*) *Military Hospital: To be Temporary Major, 10th May,* 1946.—NX203332 Captain D. M. Ross.

118th Australian General Hospital (Australian Imperial Force): To be Temporary Major, 10th May, 1946.—NX207592 Captain R. M. Rawle.

Reserve of Officers.

The undermentioned officers are transferred to the Reserve of Officers with effect from the dates indicated, and, where applicable, cease to be seconded. Officers holding temporary rank relinquish such temporary rank on the date of transfer to the Reserve of Officers:

Majors VX104270 F. P. Donoghue, 18th May, 1946, and VX13901 J. F. Connell, M.C., 8th May, 1946, Captains V146330 D. C. Lear, 18th May, 1946, NX77283 J. C. McInerney, 16th May, 1946, VX117074 H. W. Garlick, 10th May, 1946, and SX35046 A. M. Myers, 18th May, 1946.

No. 102 (*Holland Park*) *Military Hospital.*—QX45112 Captain G. P. Hildebrand, 11th May, 1946.

106th Australian General Hospital.—VX57072 Captain D. A. Alexander, 11th May, 1946.

107th Australian General Hospital.—VX14706 Major J. O. Lavarack, 11th May, 1946.

No. 110 (*Perth*) *Military Hospital.*—NX70384 Captain V. M. Putland, 11th May, 1946.

111th Australian General Hospital.—V501591 Captain H. H. Wilson, 21st May, 1946.

No. 113 (*Concord*) *Military Hospital.*—NX166209 Captain D. R. Morgan, 11th May, 1946.

No. 115 (*Heidelberg*) *Military Hospital.*—Majors VX114011 C. M. Ley, 16th May, 1946, NX160459 G. A. W. Johnston, 11th May, 1946, and VX63131 A. E. Gribble, 14th May, 1946.

124th Australian Special Hospital.—V510610 Captain E. Colin, 16th May, 1946.

17th Australian Camp Hospital.—VX88193 Major G. H. McQueen, 18th May, 1946.

68th Australian Camp Hospital.—NX103430 Captain W. G. H. Epps, 14th May, 1946.

102nd Australian Casualty Clearing Station (Australian Imperial Force).—QX48388 Major F. K. S. Hirschfeld, 10th May, 1946.

2nd/15th Australian Field Ambulance.—TX6083 Major R. A. Lewis, 21st March, 1946.

Inter-Service Medical Wing Demobilization Centres (Australian Military Forces Component).—Captains NX101738 C. A. Sara, 11th May, 1946, NX107371 R. F. G. Arnheim, 14th May, 1946, VX63314 I. A. N. McCallum, 10th May, 1946, VX81058 I. D. Wilson, 21st May, 1946, VX88156 C. A. Moore, 15th May, 1946, and W93050 W. H. J. Cole, 17th May, 1946.

Captains (Temporary Majors) NX76559 D. B. Sillar and W77 C. W. Anderson, 14th May, 1946.

3rd/14th Australian Field Ambulance.—VX104189 Captain (Temporary Major) W. G. Miller, 21st May, 1946.

Inter-Service Medical Wing Demobilization Centres (Australian Military Forces Component).—VX108162 Captain (Temporary Major) F. C. H. Davies, 10th May, 1946.

Retired List.

The undermentioned officers are placed upon the Retired List on the dates indicated, and, where applicable, cease to be seconded:

No. 113 (*Concord*) *Military Hospital.*—VX91068 Major T. E. Lowe, 21st May, 1946.

No. 115 (*Heidelberg*) *Military Hospital.*—Q119696 Captain B. M. J. Conlon, 23rd March, 1946.

Reserve Citizen Military Forces.

Australian Army Medical Corps.

1st Military District.—The undermentioned officers are retired, 21st October, 1945: Captain K. B. Shallard and Honorary Captains M. M. Ramsden and R. J. Nash.

4th Military District: To be Honorary Captain, 12th March, 1946.—Patrick Oscar Flecker.

Lieutenant-Colonel (Honorary Colonel) L. E. Le Souef, E.D., is appointed Deputy Director of Medical Services, Headquarters, Western Command (Part-Time Duty), 22nd May, 1946.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

The appointments of the following officers are terminated on demobilization with effect from the dates indicated: Temporary Wing Commander W. McL. Borland (251477), 20th May, 1946, (Temporary Squadron Leaders) J. W. L. Atkinson (251414), D. O. Longmuir (253239), 24th May, 1946, (Temporary Flight Lieutenants) D. B. Pearce (257111), G. V. Stanton (295166), 23rd May, 1946, R. T. Steele (287406), 24th May, 1946, J. P. L. Noonan (256716), 27th May, 1946, (Temporary Flight Lieutenants) C. M. McMahon (277513), 24th May, 1946, J. H. Newton (263890), 27th May, 1946, E. W. Lee (266050), 3rd June, 1946.

Special Correspondence.

LONDON LETTER.

FROM OUR SPECIAL CORRESPONDENT.

WITH the end of the first period of three weeks on bread rationing the whole subject has been much in the news. The scheme was introduced and put through in a hurry and many loose ends were left. Some confusion arose in the early days, as housewives and other interested people had laid in stocks of flour, bread, cakes, scones and buns before the zero day, and as a result of this bakers were all astray as to how much bread would be bought once rationing began. In most places supply exceeded demand, so that bakers were left with unbought bread on their hands. Some local food officers, rather than see the bread go to waste, took the law into their own hands and allowed the sale of the excess loaves without the handing over of bread units by the customers. Many bakers did the same without authorization. In other places the letter of the law was strictly enforced and food officers told bakers and suppliers that they could do nothing till the bread became unfit for human consumption: when this took place the food officers could, and did, condemn it and certify that it was fit for pig food. Delivery men in many places went on strike and refused to collect the bread units for the loaves they handed over. Altogether the first week was rather a confused business, not made any easier by the fact that many of the food officers were not well briefed in their duties. The close of the period was also somewhat chaotic, but for a different reason. The trouble arose first over the counting and handing in of the bread unit coupons received by the sellers. The big firms laid on extra staff, when it could be got, but the smaller men, with their friends and their families, had a hard time trying to separate the coupons into their classes and then to total up the numbers received. A single bread unit coupon is a small piece of paper nine-sixteenths of an inch by seven-sixteenths of an inch. Counting is no easy matter, and some of the retailers lost all patience and handed in mixed bags of coupons to the food offices with the suggestion that the sorting and counting could be done there. The Minister gave in finally and announced that for the first period sorting and counting of coupons would not be necessary. One bread unit coupon will buy half a pound of cake or a third of a pound weight of flour or a quarter of a one pound fourteen ounces loaf of bread or four scones. Coupons are of different values; some are worth two and six bread units. The size of the coupon is in inverse ratio to its value as the six is smaller than the "singleton".

Having solved the sorting and counting problem, the Minister was soon faced with another difficulty. As a result of the early hoarding of flour and the things made from it by housewives and all sellers, many people found themselves nearing the end of the rationing period with surplus bread units on their hands. These became invalid on a certain date and people sought to change them for "points" which could be used in the purchase of other rationed articles of diet. The food offices again felt the strain, as sufficient "points" were not available to allow of the exchange. Queues grew in length, printing presses worked overtime, tempers rose, till the Minister announced an extension of the time in which the exchange could be carried out. In addition goods had to be rushed to the shops to meet the extra demands set up under the greater "points" buying.

Altogether the Minister had a harrying time, but his revenge came when he was able to set out the saving in flour that had taken place as the result of rationing. When

introducing the scheme, he had forecast a figure of 7% to 10%, but a few days ago he said that results had far exceeded his expectations, as 33% of flour had been saved in the first three weeks of rationing. His triumph was short-lived, as the bakers and millers were quickly and hotly on his trail and argued that his method of arriving at his conclusion was fallacious. The Minister had got his figure of 33% by comparing the deliveries of flour by the millers in two equal periods, one just before and the other just after the introduction of rationing. The millers stated that between 50% and 60% of flour milled by them goes into bread; the remainder is used in other ways, such as home cooking, the making of biscuits and cakes in hotels and canteens. They claimed further that extra large amounts of flour were sold to all users just before rationing began and held in stock and used to supplement bread in its first rationing period which the Minister had reviewed. One miller stated that his firm alone sold 9,812,000 pounds of flour, mainly in three-pound bags such as the housewife buys, in the three weeks before zero day as against 2,432,000 pounds during the rationing period. "We are not so simple as to conclude because our sales have fallen by 75%, that the housewife has cut her consumption of flour by 75%. It may well be that in the end only the weevil will be able to look back with satisfaction on the rationing of flour." The bakers say that the sale of bread has fallen by about 10% in the rationing period, but stress that this takes no cognizance of stored flour baked and used in other ways in the home in place of bread bought in the shops.

Two points seem to emerge from this welter of contradiction. It is most unlikely that the Ministry of Food on the one hand and the millers and bakers on the other will ever agree as to the need for bread rationing or as to the amount of flour actually saved by it. From various statements made by responsible officers it is safe to predict that the end of rationing will not be long delayed.

A number of sidelights have arisen, apart from the main question. Bread is classed as a "main dish" at hotels and other places where people eat, and it is not unusual to see casual visitors coming into a dining room with the unexpended portion of the day's ration firmly clasped in their hands. It is a commonplace to see sugar and jam conveyed this way, but bread is a new departure. A party of three recently made quite an imposing entrance. Son came first with a melon in his hand, mother followed with the butter dish and the sugar bowl, and father brought up the rear with the evening paper and half a loaf of bread. Some hotels are making trouble by insisting that if people bring in bread or rolls such provender will be regarded as an "auxiliary dish", and the customer will be allowed only one main and one auxiliary dish in addition, at the expense of the hotel. We are all well trained in picking three out of the usual four courses offered (soup, meat and vegetables, sweet, cheese), but this introduces a new complication. If rationing continues it is quite likely that some enterprising firm will put on the market a hand bread container, probably made of some new and attractive sort of plastic. Even bread rationing may have a humorous side—but not for the harassed housewife.

Though milk production has increased, the winter allowance of two pints per week for all non-priority people comes in this week. The date is some ten weeks earlier than is usual and is due to a greatly increased number of consumers. At the same time parts of London are in the grip of an unofficial strike on the part of the delivery men, and some million people are threatened with a milkless weekend. The men demand a forty-hour week within five days, a minimum wage of £6 a week and time and a half for night work. People of all shades of political opinion are becoming increasingly perturbed over these unofficial strikes. They occur for the main part in those industries where great public inconvenience can be caused by strike action on the part of a small proportion of workers. From January to June this year there has not been one official strike, but nearly a million and a quarter working days have been lost in some twelve hundred unofficial ones. Bus, meat and gas services have been recent examples. The union leaders do not seem to be able to control their members, and this leads to trouble, as a few hot-heads can precipitate direct action methods. Negotiating machinery to settle all disputes is available, but it functions very slowly at times, men lose patience and the public suffers. A certain piquancy is added to this milk strike, as the employers, against whom the men have come out, are the Co-operative Wholesale Society, a nation-wide combination with strong socialist tendencies and whose proud boast is that it has no taint of the "profit motive". Mr. A. V. Alexander, the present First Lord of the Admiralty, was the head of the "C.W.S." for a number of years. These unofficial strikes are a source of embarrassment to both government departments and unions, and, unhappily, so far no method has been found that is able to cope with them.

Insurance Capitation Fee.—For a number of years attempts have been made to increase the capitation fee paid to doctors under the national health insurance scheme, which stands at present at 10s. 6d. Support for an increase was forthcoming in the report of the Spens Committee; this report stated that "the remuneration of doctors in general in 1939 was up to £200 a year below (on average £170) what it should have been". This point was stressed in recent discussions between the Insurance Acts Committee of the British Medical Association and officials of the Ministry of Health. The Minister was present at one meeting, but "wanted to wrap up the question of the immediate capitation fee with discussions on the remuneration of doctors under the proposed new national health service". The Insurance Acts Committee took the view that rates of pay under the national health service was not a point that they were empowered or willing to discuss. The Minister then stated that while he accepted the substance of the recommendations of the Spens Committee upon the general scope and remuneration which general practitioners should enjoy in a public service, the settling of the actual terms of remuneration would require the consideration of a number of factors. In his opinion the translation of the Spens recommendations was a matter which must be discussed with the profession, but he felt that it was impossible to separate the question of the current capitation rate from that of remuneration under the new health service. As the Insurance Acts Committee was not willing to take part in such discussion, the Minister proposed to defer discussion and also to raise the present capitation fee from 10s. 6d. to 12s. 6d., and to regard this rate as being operative as from January 1, 1946. The Insurance Acts Committee replied that they regarded the proposed increase as "gravely inadequate", but would be prepared to recommend insurance practitioners to accept in the interim a fee of 15s. retrospective to January 1, 1946. They added that they would be willing to leave the fixing of the actual capitation fee to the Spens Committee, provided that the Minister and the Insurance Acts Committee would agree in advance to accept any recommendation the Spens Committee might make. There the matter rested, and a full account of the various meetings is given in the *British Medical Journal*, July 27, 1946. However, on August 24 it was stated in *The Times* newspaper that: (1) The capitation fee under the national insurance scheme has been raised from 10s. 6d. to 12s. 6d., to date from January 1, 1946, to April 1, 1948, the day on which the new national health service will begin to operate. (2) The accumulated back payments to doctors will be made as soon as arrangements can be made, if possible, at the end of September. (3) The cost of the increased fee for the period January 1, 1946, to April 1, 1948, will be about £4,500,000. (4) Rates of pay under the national health service will be fixed later.

It remains to be seen what further action will be taken by the doctors. The most drastic proposal is that all insurance practitioners should be asked if they are prepared to resign their appointments, under the Insurance Act, unless the capitation fee is raised to 15s.

Correspondence.

MEDICAL NOSTRUMS.

SIR: In spite of its "higher education" the medical profession is not a great deal different from the general public in respect to the use of medical nostrums.

We are bombarded by the presentation of numerous "remedies" *et cetera* which we prescribe for our patients oft-times without thought nor reason. This is very pronounced in the indiscriminate manner in which "sulpha" drugs are prescribed, frequently in insufficient doses and without proper instructions, for patients to use in their own homes and while continuing their daily avocations.

Recently I was asked by the "detailer" for a well-known and reputable firm what I really thought of the use of "sulpha" drugs in nasal "drops". I replied: "Just plain hooey."

I have had an interesting experience in that respect, being one of those so common people who are afflicted with what I can only call "an allergic diathesis", for over thirty years

I have had various treatments of my nose and sinuses, operative and otherwise, which have not been without benefit, but I still have to use "drops" fairly often to secure comfort in nasal breathing.

Recently I began to use a well-known preparation to which had been added a "sulpha" drug in suspension. However, every time I used this it not only failed to give relief but actually increased the discomfort. I filtered the suspension from the preparation, with the result that it is now very comforting.

I have on no occasion seen any one who has derived any advantage from the presence of a "sulpha" drug in nasal drops, but on the contrary have met others who have found that these preparations are distinctly harmful when used in that manner. The indiscriminate prescribing of these drugs for internal and external use in ear conditions is likewise often a means of perpetuating the patient's complaint.

Instead of criticizing the unfortunate public for indulging in what we call quack nostrums, especially where so often the qualified and registered practitioner has failed to give relief, it better behoves the profession to exercise more judgement in its advice and prescriptions.

Please pardon the reticence of my signature.

Yours, etc.,

"NOT A BLOTTING PAPER DOCTOR."

August 23, 1946.

THE BASIS OF POST-OPERATIVE TREATMENT IN APPENDICITIS AND PERITONITIS: FOLK-LORE OR PHYSIOLOGY?

SIR: I am glad to hear of the treatment of peritonitis adopted by Dr. Downing and his colleagues at Kyneton. He and I have realized the importance of rest for the inflamed and injured tissue, a principle which has been established long before he and I were born. But beyond this, I disclaim the close relationship or identity which he would claim. Our other principles and our methods are quite different.

His method, as stated, is just plain starvation. But this is not good enough, except for two or three days. When the appendix has ruptured twenty-four hours previously into an unprotected peritoneal cavity, it may be three or four weeks before the peritoneum finally wins. The battle rages chiefly in the lower part of the abdomen. Loculi are formed. Inflammatory masses may appear and disappear, or residual abscesses may need opening, usually in the right iliac region or pelvis, sometimes in the left iliac region, less commonly in the subphrenic regions. Dr. Downing provides "no fluid or food by mouth". My method correlates the details of intake with the stage of the disease and provides sustenance for the patient including all the basic elements of a sound diet with its full complement of vitamins. It ensures a sufficient fluid intake in all cases except those with actual obstruction in which gastric aspiration withdraws considerable quantities. These cases need intravenous fluids. They are very rare under proper management. (They are common if the absorbing surface of the upper coils is converted into a secreting surface by intestinal irritants given by mouth. The potential obstruction at the ileo-caecal loop is thus converted into an actual obstruction. The loop can deal with a trickle, but not with a torrent.)

"Elective alimentary rest" takes advantage of the great absorptive area of the upper, relatively unaffected alimentary tract, and at the same time rests the inflamed part. This principle, based on physiology as described in my article, is not recognized by Dr. Downing. The jejunum remains relatively unaffected, even in the peritonitis due to rupture of a duodenal or gastric ulcer.

I would strongly deprecate the meddling with the pelvic viscera which is inseparable from rectal salines. The tube is inserted well in, so that it can't fall out, and impinges against the anterior wall of the rectum with the coils of ileum lying in front of it, the very centre of the inflamed area. Then saline is injected and disturbs the sigmoid colon, also part of the inflamed area. Irritation and distension of a segment of bowel tend to disturb the segments above.

Again, we differ in regard to the sulphonamides. I believe that their use is inadvisable in the first two weeks of the disease, because: (i) The peritoneal commotion due to vomiting is a catastrophe in early peritonitis, and this may occur with any of the sulphonamides (Medical Research Council, War Memorandum Number 10, 1945, page 22). (ii) *Bacterium coli* is not very sensitive to sulphonamides. The enterococci "are almost completely insensitive to sulphonamides, as judged either by tests in vitro or by clinical experience" (*loco citato*). (iii) The concentration of sulphonamides, which may kill *Bacterium coli* in the urine, cannot be achieved in the tissue fluids, still less in the peritoneal exudate in peritonitis. (iv) The results which I have achieved without sulphonamides are superior to the results claimed by those who use sulphonamides. I feel that the doubtful bacteriostatic value of the drugs may be outweighed by their disturbing influence upon the alimentary tract.

Yours, etc.,

235, Macquarie Street, Sydney, V. J. KINSELLA.

August 31, 1946.

THE DISTRIBUTION OF FLUORINE IN POTABLE WATERS IN NEW SOUTH WALES AND TASMANIA.

SIR: The following facts may help to explain the case of "mottled enamel" reported by L. Opit (THE MEDICAL JOURNAL OF AUSTRALIA, August 17, 1946, page 250). The causative agent in the ætiology of dental fluorosis is fluorine in drinking water, the concentration of fluorine being at least 0·8 part per million. The threshold value of fluorine in drinking water is that which will cause mild mottling of the teeth of 10% of persons using the water continuously during the period of tooth formation, and this value has been established by Dean and Elvove in a series of rigidly controlled epidemiological investigations in the United States (*Public Health Reports*, Volume L, 1935, pages 1719-29, D.6). Dental fluorosis is an endemic disease. Isolated cases of hypoplasia which resemble mottled enamel are generally due to nutritional deficiencies or specific toxins, factors operative during the first two years of life, the period of the formation of the organic matrix of the enamel.

Yours, etc.,

Dental School, University of Sydney, Sydney. NOEL D. MARTIN.

September 4, 1946.

Obituary.

VERA SCANTLEBURY BROWN.

WE are indebted to Dr. H. Boyd Graham for the following appreciation of the late Dr. Vera Scantlebury Brown.

The death of Dr. Vera Scantlebury Brown on July 14, 1946, has not only closed a distinguished career of very great benefit to the women and children of Victoria, but has also taken from our midst one who by her charm and geniality and her rare enthusiasm collected innumerable friends to whom she endeared herself.

Born on August 7, 1889, at Linton, Victoria, she was one of the daughters of the late Dr. and Mrs. G. J. Scantlebury, of Cheltenham. Her school days were passed at Toorak College and were full of promise, as she was alert and observant and had a love for science and scientific methods. Later, in 1913, she completed the medical course at the University of Melbourne, and in the following year was one of the resident medical officers at the Melbourne Hospital. In 1915 she joined the resident medical staff of the Children's Hospital, and soon made herself indispensable and accepted the onerous duties of senior medical officer in wartime with a meagre set of colleagues and seriously depleted honorary medical staff. In 1917 she handed her responsibilities over to a returned medical officer and went off to the war herself.

Attached to the Royal Army Medical Corps, Dr. Scantlebury served as assistant surgeon to Dr. L. Garrett Anderson at Endell Street Military Hospital, London. When the war ended she became associated with Dr. Lewin, of Wimpole Street, London, in the Children's Clinic. She returned to Melbourne in 1919 and became a resident medical officer at the Women's Hospital for a short time. She was soon deeply involved in work for women and children, and because of her outstanding ability, her earnestness, the soundness of her training and the richness of her experience, appointments were thrust upon her. She was an honorary physician at the Queen Victoria Hospital, an honorary anæsthetist at the Women's Hospital, a clinical assistant at the Children's Hospital, honorary medical officer to the Victorian Baby Health Centres' Association, medical officer to the Free Kindergarten Union of Victoria, and medical officer to the Melbourne Church of England Girls' Grammar School. She continued in the last-named office to the end,

and the school soon set the example for others, and "Dr. Vera" demonstrated the benefits of regular medical inspection.

In 1924 she managed to find the time to obtain the M.D. degree, followed by a tour of New Zealand, Canada and the United States of America to study the organizations in those countries aiming at the improvement of conditions for mothers and babies. She was already identified with the voluntary pioneering work of the creation of baby health centres in Melbourne along with Dr. Isabel Younger and other enthusiasts, but none of the Australian governments had accepted any reasonable degree of responsibility. Soon an arrangement was made for subsidies contributed towards the expenses of the centres by the State and the municipality concerned and administered through the activities of the voluntary association. In 1925 the Government of Victoria assumed control and formed a Maternal and Infant Welfare Division in the Department of Public Health.

[Broothorn Studios, Melbourne.]

Dr. Vera Scantlebury accepted appointment on a part-time basis as the director of the new division and thus got the opportunity for which she was so completely equipped. Rapidly she displayed great organizing ability and breadth of vision and sincerity; a network of baby health centres is now spread throughout Victoria; those centres should be rededicated as a memorial to her. In the early days Dr. Scantlebury and Dr. Henrietta Main surveyed Victoria and New Zealand, and their report stimulated the Government into action and enthused the voluntary workers. It has been followed by many more stimulating reports from the director whose energy seemed indefatigable and whose influence, single-mindedness, sincerity and foresight overcame sectional and departmental barriers and steadily widened the horizons taking in the Infant Welfare Training Certificate and Mothercraft Training Certificate courses, and activities for children of the pre-school ages following infancy. It was the outcome of a report submitted by her to the National Health and Medical Research Council that the Commonwealth Government decided to use the Coronation Commemoration Grant of £100,000 for the benefit of pre-school age children and established the excellent Lady Gowrie Child Centres. In 1944, Dr. Scantlebury Brown had the satisfaction of adding the section of pre-school child welfare to her directorate and developed a sound plan for widespread dissemination of information concerning the scientific development of children for the guidance of parents. She rightly insisted that this was a health matter rather than simply an educational one, and always urged that standards must be attained and maintained covering the training of personnel, the programmes, the buildings and the equipment to give the opportunity to the children to have the best possible physical, mental and emotional health and to become socially adjusted very early in life.

When Dr. Scantlebury accepted the appointment in the Public Health Department she severed official connexion with the voluntary bodies, but unofficially she retained close affiliation with her successors and their associates and always strove to integrate and coordinate their activities to conform with her master plans. She sought the assistance of members of the Melbourne Pædiatric Society in the compilation of the "Public Health Department Guide to Infant Feeding" which systematized as far as was desirable the advice given at baby health centres, at out-patient departments and in the training of nurses and medical students. She prepared and delivered many important addresses for conferences and congresses and was in constant demand as the guest speaker at annual meetings.

On September 18, 1926, Dr. Vera Scantlebury married Edward Byam Brown, D.Sc., now the associate professor of electrical engineering at the University of Melbourne. Soon afterwards she added his surname to her professional name, and thereafter became known as Dr. Scantlebury Brown. The home they made for themselves became an ideal one, despite the furiously busy professional careers they followed. In the home they gave a practical demonstration of wise parenthood, generous hospitality and efficient home management. Their son and daughter had the opportunities they wanted to secure for all children; they had their individual hobbies and leisure time amusements and occupations; their friends and acquaintances were often called in to share the fun and spent many happy hours in good company. She was fond of music and could often be caught at the piano. She was a gracious hostess with an easy manner eschewing formality and ceremony. In her home life as in her professional sphere she was a pivotal figure. She will be sadly missed but proudly remembered by those who loved her.

DR. H. N. FEATONBY writes: In 1926, at the request of the Victorian Government, Dr. Vera Scantlebury Brown and Dr. Henrietta Main presented a report on the welfare of women and children, which included recommendations for the improvement of existing services. The then Minister of Health, Sir Stanley Argyle, accepting the recommendations of this report, established the Infant Welfare Division of the Department of Health, with Dr. Scantlebury Brown as the director—a position she held until her death.

In 1926 infant welfare work was carried out by voluntary societies with some assistance from municipalities and the State Government. In twenty years this work has been expanded into a great State-wide service, with many fine municipal infant welfare centres, mobile services in country districts, and a correspondence scheme for mothers in remote rural areas.

The director at the beginning of her career recognized the necessity of a high standard of training for nurses in this new service. She sought and obtained government subsidies for training schools, provided they complied with certain necessary standards of efficiency. The Nurses Board at her request also laid down a prescribed course of training, appointed examiners and established a State register for those who had completed this course, and had passed the prescribed examination.

Dr. Scantlebury Brown next turned her attention to the pre-school child—for whose welfare little provision was being made. A report on this question was made to the National Health and Medical Research Council in 1937. It was largely due to this report that the Commonwealth Government granted £100,000 for the benefit of this age group, and established with the fund so provided the Lady Gowrie Pre-School Centres in each State capital city.

The director also succeeded in establishing a pre-natal branch, which is already providing a valuable and necessary service for expectant mothers. Dr. Scantlebury Brown during her twenty years of service had to triumph over the many administrative difficulties which were met during the years of depression and during the war. These difficulties were met with unflagging cheerfulness, faith and confidence.

The very great services of Dr. Scantlebury Brown to the State were widely recognized during her lifetime. Her death has inspired genuine and sincere tributes, not only from the Premier of the State, but from municipal authorities and mothers from every corner of Victoria. We, who were her colleagues, were very proud of her attainments, but she was far more to us than a great administrator, she was a gay and lovable human being, who inspired in her colleagues and staff a feeling of intense loyalty and affection.

The officers of the Department of Health to which she gave such long and distinguished service will forever hold in veneration the name of this great and good woman.

DR. KATE CAMPBELL writes: To know Vera Scantlebury Brown was to appreciate the significance of the old injunction: "Keep thy heart with all diligence, for out of it are the issues of life." Her outstanding quality was a warm and genuine humanity which governed her whole life. Whether one met her in the everyday environment, or heard her address a meeting, one was instantly conscious of her kindliness and sympathy. It was this which so endeared her to us, and which made her work so outstandingly successful. The accomplishment of any project was, to her, not a personal matter, but something to be done for the betterment of children. It was this selflessness which enabled her to overcome the apathy and active hostility which are the lot of pioneers in a new field. She had also a most unusual ability to see the viewpoints of others, and to understand why people felt as they did. Her insight into human nature and her generosity of mind made it possible for her to meet on common ground the most diverse types and to work amicably with them all. Her enthusiasm was inspiring, and vitalized all with whom she came into contact. In her vision she was always several years ahead of the rest of us. Her work for the women and children of Victoria is felt in every home throughout the State.

In her private life her activities were varied and many. When nursery schools were being introduced, she started one for her own child and any others who wished to come. She was just as much interested in every child as in her own, and just as pleased with their progress. Her holiday homes at the sea and in the hills were always available for anyone who she thought looked tired or was in need of a respite from the city—and at her home in Hawthorn she dispensed charming hospitality. Her kindness and generosity were literally unbounded, and her practical help to those in trouble often led her to lengths which were the consternation of her friends. Her consideration for others and her encouragement to all young people were a byword to those who knew her. She had a delightful and ever-present sense of humour, completely free from malice. She was an ideal friend, loyal, loving, gay, interested and understanding. She valued highly "the things that are more excellent" and lived her unworldly life in accordance with her standard. It was the simple things of life which gave her pleasure and contentment. In her home life she was fortunate in the affection, help and cooperation always given by her husband, Professor Brown, and by these she set great store. Her son and daughter were a great happiness to her, and she was to them a most devoted mother.

She bore her last long and painful illness with a truly amazing courage. From her bed she directed the activities of her department, and worked on a new edition of her "Guide to Infant Feeding" till twenty-four hours before her death. Her passing leaves a gap which we all realize cannot be filled, and a memory which is an abiding inspiration.

GEORGE ARTHUR BUCHANAN.

WE are indebted to Dr. G. Moncrieff Barron for the following appreciation of the late Dr. George Arthur Buchanan, whose death was recorded recently in these pages.

George Arthur Buchanan was born at Baltimore, United States of America, and was brought early in life to Brisbane by his father, the Reverend G. D. Buchanan, who was Presbyterian minister at Wickham Terrace, Brisbane. Later the father moved to Chalmers Church, Sydney, and it was there that I first became associated with the son. George Buchanan studied medicine at the University of Sydney and graduated with honours in 1904 as Bachelor of Medicine and Master of Surgery. He was resident medical officer at Prince Alfred Hospital in 1904 and resident pathologist in 1905. He started practice at Nyngan, New South Wales, but after five years he moved to Goulburn, which was to be his home for twenty-eight years. In Goulburn he built up an extensive practice and did a lot of brilliant work, particularly as a surgeon. He was, of course, on the staff of the Goulburn District Hospital. He was connected with all the principal organizations in Goulburn and was one of the leading citizens. He was highly respected by all with whom he came into contact and was beloved of his patients. This was equally true of him when he came to join me in practice at Manly about ten years ago. In Manly, as in Goulburn, his surgical work was most valuable.

George Buchanan was a deeply read man, particularly in philosophy, which he studied with his father. He was probably one of the best educated men in the medical profession of this country, but he was extremely modest and reserved. He had one or two serious illnesses and also suffered the loss of a finger, which rather cramped his style, for he was an able golfer and billiard player. Truly might one say of him in the words of Shakespeare:

> His life was gentle; and the elements
> So mix'd in him that Nature might stand up
> And say to all the world, "This was a man!"

FOURNESS BARRINGTON.

WE regret to announce the death of Dr. Fourness Barrington, which occurred on September 1, 1946, at Sydney.

GEORGE JAMES ARCHIBALD BILLING HALFORD.

WE regret to announce the death of Dr. George James Archibald Billing Halford, which occurred on September 3, 1946, at Wattletree Road, Malvern, Victoria.

GEORGE GRAY NICHOLLS.

WE regret to announce the death of Dr. George Gray Nicholls, which occurred on September 3, 1946, at Wattle Valley Road, Canterbury, Victoria.

The Royal Australasian College of Surgeons.

GORDON CRAIG SCHOLARSHIPS IN SURGERY.

THE Council of the Royal Australasian College of Surgeons announces the result of applications for the second award of Gordon Craig Scholarships.

Travelling Scholarships.—David Lindsay Dey, Douglas Burland Duffy, Ian Monk.

Scholarships for Work in Australia.—Edward William Gibson, Graeme Lindsay Grove, James Stuart Guest, Wallace James Pullen; Arthur Edward McKenzie Reddel, Thomas Ernest Guyatt Robertson, Margery Scott-Young.

The scholarships are awarded at half-yearly intervals, and the successful applicants on the occasion of the first award were:

Travelling Scholarships.—Douglas Robert Leslie, Kenneth Newman Morris, Stanley Francis Reid, Thomas Edward Wilson.

Scholarships for Work in Australia.—Victor Henry Cumberland, Justin Paul Fleming, Clarence Arthur Campbell Leggett, Ian Haig McConachie, Gordon Graham Calder MacKenzie, Frederick Roy Phillips, Harry Matthew John Windsor.

These scholarships are awarded to enable young graduates of exceptional ability and promise to undergo post-graduate education in surgery. They are tenable for one year and are made possible as a result of a generous bequest received from the late R. Gordon Craig, of Sydney, founder of the college.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Ryan, William Patrick, M.B., 1937 (Univ. Sydney), 14, William Street, North Sydney.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association:

Young, Lloyd Alan Forbes, M.B., B.S., 1946 (Univ. Melbourne), General Hospital, Launceston.

Notice.

A CLINICAL MEETING of the Medical Women's Society of New South Wales will be held at the Rachel Forster Hospital, Redfern, on Wednesday, September 25, 1946, at 8 o'clock p.m. All medical practitioners are invited to attend.

THE FEDERAL MEDICAL WAR RELIEF FUND.

THE following contributions to the Federal Medical War Relief Fund have been received:

New South Wales.

C. R. Furner, Noel Rau (second contribution), £21.
Anonymous (in special memory of Dr. Gordon Jones, Dr. Geoff Cooley and Dr. Max Brown), G. W. Ashby, H. G. Howell, A. W. Morrow, £10 10s.
K. W. Alexander, O. J. Ellis, H. S. Harper, G. M. Hay, P. D. Hipsley, A. A. Moon, £5 5s.
L. A. H. Phillips, J. G. Waine, £3 3s.
F. A. Morrison, S. E. L. Stenning, £2 2s.
R. S. Irwin, £1 1s.
J. M. Oldham, £1.
Anonymous, 4s. 8d.
Total: £128 5s. 8d.

Tasmania.

W. K. McIntyre and R. P. Booth, £10.
T. J. Ick, £2 5s.
Total: £12 5s.
Grand total: £14,962 4s. 2d.

Books Received.

"O Nita Rinkus: The Story of an Easter Egg", by A. W. D'Ombrain; 1946. Sydney: Australasian Medical Publishing Company, Limited. 11″ × 8½″, pp. 37, with illustrations, some coloured. Price: 12s. 6d.

"Medical Emergencies", by C. Newman, M.D. (Cantab.), F.R.C.P. (London); Third Edition; 1946. London: J. and A. Churchill Ltd. 8″ × 5½″, pp. 128. Price: 10s. 6d.

"What Else is There?", by Margaret Trist; 1946. Sydney, London: Angus and Robertson Limited. 7¼″ × 5″, pp. 274. Price: 7s. 6d.

"Tell Us About the Turkey, Jo", short stories by Alan Marshall; 1946. Sydney and London: Angus and Robertson Limited. 7¼″ × 5″, pp. 218. Price: 7s. 6d.

"The Twig is Bent", by Capel Boake; 1946. Sydney and London: Angus and Robertson Limited. 7¼″ × 5″, pp. 296. Price: 7s. 6d.

"C.S.I.R.—1945", by G. Lightfoot, M.A.; 1945. Melbourne: Commonwealth of Australia, Council for Scientific and Industrial Research. 10″ × 7½″, pp. 98, with many illustrations.

"Demonstrations of Physical Signs in Clinical Surgery", by Hamilton Bailey, F.R.C.S. (England), F.I.C.S.; Tenth Edition, Revised; 1946. Bristol: John Wright and Sons, Ltd. London: Simpkin Marshall (1941) Ltd. 9″ × 5¾″, pp. 388, with 573 illustrations, a number of which are in colour. Price: 30s. net.

"Peptic Ulcer: Its Diagnosis and Treatment", by I. W. Held, M.D., F.A.C.P., and A. Allen Goldbloom, M.D., F.A.C.P.; 1946. Springfield, Illinois: Charles C. Thomas. 9¼″ × 6″, pp. 394, with many illustrations. Price: $6.50.

Medical Appointments.

Dr. L. E. Le Souef has been appointed honorary consulting surgeon to the Wooroolloo Sanatorium, Western Australia.

Dr. W. N. Etheridge and Dr. D. R. Moore have been appointed medical officers of health for Zeehan and Rosebery respectively, Zeehan municipality, Tasmania.

Dr. G. A. Wright has been appointed Medical Superintendent of the Mental Hospitals, Mont Park and Janefield, and of the Repatriation Mental Hospital, Bundoora, Victoria.

Dr. C. Farran-Ridge has been appointed Medical Superintendent of the Mental Hospital and Receiving House, Ballarat, Victoria.

Dr. H. J. C. Edmonds has been appointed Medical Superintendent of the Mental Hospital, Ararat, Victoria.

Dr. D. Gordon has been appointed Officer of Health (Industrial Hygiene) on probation, Department of Health and Home Affairs, under the provisions of *The Public Service Acts*, 1922 to 1945, and *The Health Acts*, 1937 to 1945, of Queensland.

Dr. K. C. Donovan has been appointed visiting surgeon to the Goulburn Reformatory, Goulburn, New South Wales.

Professor Roy Douglas Wright has been appointed member of an Interim Council in pursuance of the provisions of the *Australian National University Act*, 1946.

Dr. K. J. Meagher has been appointed Medical Officer at Millbrook Rise, Tasmania.

Dr. E. Guthaner has been appointed Government Medical Officer at Gatton, Queensland.

Diary for the Month.

SEPT. 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
SEPT. 18.—Western Australian Branch, B.M.A.: General Meeting.
SEPT. 19.—Victorian Branch, B.M.A.: Executive Meeting.
SEPT. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
SEPT. 19.—South Australian Branch, B.M.A.: Council Meeting.
SEPT. 24.—New South Wales Branch: Ethics Committee.
SEPT. 25.—Victorian Branch, B.M.A.: Council Meeting.
SEPT. 26.—New South Wales Branch, B.M.A.: Branch Meeting.
SEPT. 27.—Queensland Branch, B.M.A.: Council Meeting.
OCT. 1.—New South Wales Branch, B.M.A.: Council Quarterly.
OCT. 2.—Western Australian Branch, B.M.A.: Council Meeting.
OCT. 2.—Victorian Branch, B.M.A.: Branch Meeting.
OCT. 3.—South Australian Branch, B.M.A.: Council Meeting.
OCT. 4.—Queensland Branch, B.M.A.: Branch Meeting.
OCT. 4.—New South Wales Branch, B.M.A.: Annual Meeting of Delegates.
OCT. 8.—Tasmanian Branch, B.M.A.: Ordinary Meeting.
OCT. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

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